

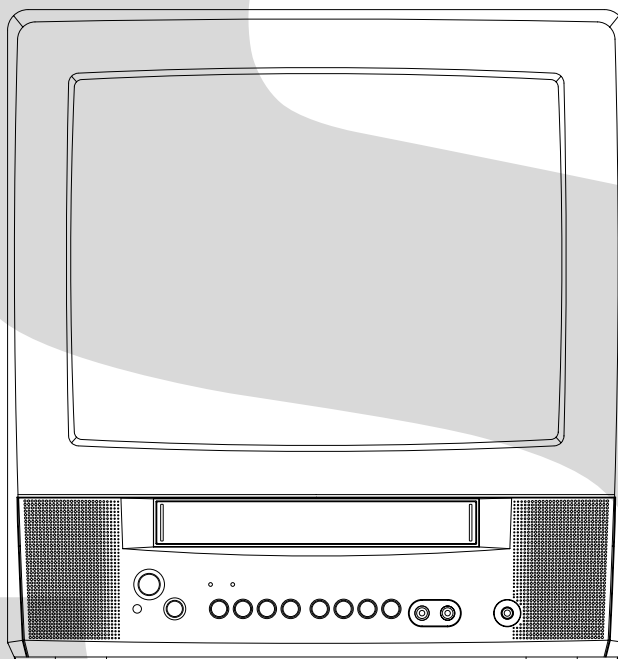
TOSHIBA

FILE NO. 140-200215

SERVICE MANUAL

COLOR TELEVISION/ VIDEO CASSETTE RECORDER

MV13N3



SERVICING NOTICES ON CHECKING

1. KEEP THE NOTICES


As for the places which need special attentions, they are indicated with the labels or seals on the cabinet, chassis and parts. Make sure to keep the indications and notices in the operation manual.

2. AVOID AN ELECTRIC SHOCK

There is a high voltage part inside. Avoid an electric shock while the electric current is flowing.

3. USE THE DESIGNATED PARTS

The parts in this equipment have the specific characters of incombustibility and withstand voltage for safety. Therefore, the part which is replaced should be used the part which has the same character.

Especially as to the important parts for safety which is indicated in the circuit diagram or the table of parts as a  mark, the designated parts must be used.

4. PUT PARTS AND WIRES IN THE ORIGINAL POSITION AFTER ASSEMBLING OR WIRING

There are parts which use the insulation material such as a tube or tape for safety, or which are assembled in the condition that these do not contact with the printed board. The inside wiring is designed not to get closer to the pyrogenic parts and high voltage parts. Therefore, put these parts in the original positions.

5. TAKE CARE TO DEAL WITH THE CATHODE-RAY TUBE

In the condition that an explosion-proof cathode-ray tube is set in this equipment, safety is secured against implosion. However, when removing it or serving from backward, it is dangerous to give a shock. Take enough care to deal with it.

6. AVOID AN X-RAY

Safety is secured against an X-ray by considering about the cathode-ray tube and the high voltage peripheral circuit, etc.

Therefore, when repairing the high voltage peripheral circuit, use the designated parts and make sure not modify the circuit.

Repairing except indicates causes rising of high voltage, and it emits an X-ray from the cathode-ray tube.

7. PERFORM A SAFETY CHECK AFTER SERVICING

Confirm that the screws, parts and wiring which were removed in order to service are put in the original positions, or whether there are the portions which are deteriorated around the serviced places serviced or not. Check the insulation between the antenna terminal or external metal and the AC cord plug blades. And be sure the safety of that.

(INSULATION CHECK PROCEDURE)

1. Unplug the plug from the AC outlet.
2. Remove the antenna terminal on TV and turn on the TV.
3. Insulation resistance between the cord plug terminals and the external exposure metal **[Note 2]** should be more than 1M ohm by using the 500V insulation resistance meter **[Note 1]**.
4. If the insulation resistance is less than 1M ohm, the inspection repair should be required.

[Note 1]

If you have not the 500V insulation resistance meter, use a Tester.

[Note 2]

External exposure metal: Antenna terminal

HOW TO ORDER PARTS

Please include the following informations when you order parts. (Particularly the VERSION LETTER.)

1. MODEL NUMBER and VERSION LETTER

The MODEL NUMBER can be found on the back of each product and the VERSION LETTER can be found at the end of the SERIAL NUMBER.

2. PART NO. and DESCRIPTION

You can find it in your SERVICE MANUAL.

TAPE REMOVAL METHOD AT NO POWER SUPPLY

1. Remove the VCR block from the main unit.
(Refer to item 1 of the DISASSEMBLY INSTRUCTIONS.)
2. Remove the screw ① of the Deck Chassis and remove the Loading Motor.
3. Rotate the Pinch Roller Cam in the direction of the arrow by hand to slacken the Video Tape.
4. Rotate the Clutch Ass'y either of the directions to wind the Video Tape in the Cassette Case.
5. Repeat the above step 3~4. Then take out the Video Cassette from the Deck Chassis. Be careful not to scratch on the tape.

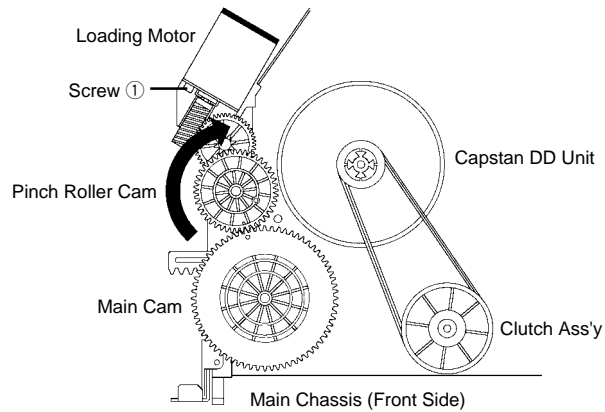


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GENERAL SPECIFICATIONS

G-1	TV System	CRT	CRT Size / Visual Size		13 inch / 335.4mmV
			CRT Type		Normal
			Deflection		90 degree
			Magnetic Field	BV/BH	+0.45G / 0.18G
		Color System	NTSC		
		Speaker	1Speaker		
			Position		Front
			Size		1.5 x 2.5 Inch
			Impedance		8 ohm
			Sound Output	MAX	
		10%(Typical)		1.0 W	
G-2	VCR System	System	VHS Player / Recorder		
		Video System	NTSC		
		Hi-Fi STEREO	No		
		NTSC PB	-		
		Deck	DECK	OVD-7	
			Loading System	Front	
			Motor	3	
		Heads	Video Head	2 Head	
			FM Audio Head	No	
			Audio /Control	Mono/Yes	
			Erase(Full Track Erase)	Yes	
		Tape Rec	PAL	-	
		Speed	NTSC	SP/SLP	
			Play	PAL	-
			NTSC	SP/SLP	
			Fast Forward / Rewind Time (Approx.) at 25oC		FF:4'50"/REW:2'30"
		with Cassette	T-120		
	Forward/Reverse	NTSC or PAL-M	SP/SLP=3x,5x/9x,15x		
	Picture Search	PAL or SECAM	-		
	Frame Advance	-			
	Slow Speed	-			
G-3	Tuning System	Broadcasting System	US System M		
		Tuner and	System	1Tuner	
		Receive CH	Destination	US(w/CATV)	
			Tuning System	F-Synth	
			Input Impedance	VHF/UHF 75 ohm	
			CH Coverage	2-69, 4A,A-5~A-1, A~I, J~W,W+1~W+84	
		Intermediate	Picture(FP)	45.75MHz	
		Frequency	Sound(FS)	41.25MHz	
			FP-FS	4.5MHz	
		Preset CH	No		
		Stereo/Dual TV Sound	No		
			Tuner Sound Muting	Yes	
G-4	Signal	Video Signal	Input Level	1 V p-p/75 ohm	
			Output Level	-	
			S/N Ratio (Weighted)	50dB	
			Horizontal Resolution at SP Mode	220Lines	
		Audio Signal	Input Level	-8dBm/50k ohm	
			Output Level	-	
			S/N Ratio at SP (Weighted)	38dB	
			Harmonic Distortion at SP (1KHz)	Typical 1.5 %	
			Frequency Response at SP	100Hz - 10kHz	
			at LP	-	
			at SLP	100Hz - 4kHz	
		Hi-Fi Audio Signal	Dynamic Range : More than	-	
			Frequency Response	-	
			Wow And Flutter : Less than	-	
			Channel Separation : More than	-	
			Harmonic Distortion : Less than	-	
G-5	Power	Power Source	AC	120V 60Hz	
			DC	-	
		Power Consumption	at AC	65 W at 120V 60Hz	
			at DC	-	
			Stand by (at AC)	5 W at 120V 60 Hz	
			Per Year	-	
	Protector	Power Fuse	Yes		
		Dew Sensor	No		

GENERAL SPECIFICATIONS

G-6	Regulation	Safety Radiation X-Radiation	UL FCC DHHS
G-7	Temperature	Operation Storage	+5oC ~ +40oC -20oC ~ +60oC
G-8	Operating Humidity		Less than 80% RH
G-9	On Screen Display	Menu Menu Type Timer Rec Set Channel Setup TV/CATV Auto CH Memory Add/ Delete Guide CH Set TV Setup V-chip Set On/Off Timer Set Picture Audio Sap On/Off Auto Repeat On/Off System Setup Clock Set Language Auto Clock On/Off Standard Time Daylight Saving Time Commercial Advance Marking On/Off Blueback On/Off Playback Auto/Manual Unmarked Tape Movie Advance Go To Movie Go To Preview G-CODE(or SHOWVIEW or PLUSCODE)No. Entry Clock CH/AV Tape Counter(Linear Counter) Tape Speed Sleep Time Stereo/Audio Output Bilingual SAP Control Volume Level Bright / Contrast / Sharpness / Color Tint Bass/Treble/Balance Manual Tracking Play/Stop/FF/Rew/Rec/OTR/T-Rec/Pause/Eject/Tape In (Symbol Mark) Auto Tracking/Manual Tracking Caption / Text Index Mute Hi-Fi Repeat Zero Return DEW	Yes Character Yes Yes Yes Yes No Yes Yes Yes Yes No No Yes Yes Yes Yes Yes No No No No No No Yes Yes Yes Yes Yes No No No Yes Yes Yes No Yes Yes No Yes Yes No Yes Yes No
G-10	OSD Language		English French Spanish
G-11	Clock,Timer and Timer Back-up	Calendar Timer Events One Touch Recording Max Time OTPB Valid Time Sleep Timer Max Time Step On/Off Timer Program(On Timer / Off Timer) Auto Shut Off No Signal No Operation Timer Back-up (at Power Off Mode)	1990/1/1 ~ 2081/12/31 8 prog/ 1 month 6 Hours No 120 min. 10 min. 1 prog. 15 min. - 5 sec.

GENERAL SPECIFICATIONS

G-12	Remote Control	Unit	RC-GC
		Glow in Dark Remocon	Yes
		Format	NEC
		Custom Code	40-BFh , 44-BBh
		Power Source	3V
		Voltage(D.C)	UM-4 x 2 pcs
		UM size x pcs	
		Total Keys	42 Keys
		Keys	
		Power	Yes
		1	Yes
		2	Yes
		3	Yes
		4	Yes
		5	Yes
		6	Yes
		7	Yes
		8	Yes
		9	Yes
		0	Yes
		CH Up	Yes
		CH Down	Yes
		Volume Up	Yes
		Volume Down	Yes
		Input Select	Yes
		Play	Yes
		F.Fwd	Yes
		Rew	Yes
		Pause/Still	Yes
		Stop	Yes
		Rec/OTR	Yes (2Keys)
		Eject	Yes
		Counter Reset	Yes
		Speed	Yes
		Timer Rec	Yes (2Keys)
		TV Monitor	No
		Quick View	Yes
		Program	Yes
		Slow	No
		Auto Tracking	Yes
		Set/Tracking+	Yes
		Set/Tracking -	Yes
		Menu	Yes
		Enter	Yes
		Cancel	Yes
		Call	Yes
		TV/Caption/Text	Yes
		Sleep Timer	Yes
		Mute	Yes
		Zero Return	Yes
		CM Skip	Yes
		Audio Select	No

GENERAL SPECIFICATIONS

G-13	Features	Auto Head Cleaning	No
		Auto Tracking	Yes
		HQ (VHS Standard High Quality)	Yes
		Auto Power On, Auto Play, Auto Rewind, Auto Eject	Yes
		VIDEO PLUS+(SHOWVIEW,G-CODE)	No
		Auto Clock	Yes
		Forward / Reverse Picture Search	Yes
		One Touch Playback	No
		Auto CH Memory	Yes
		Closed Caption	Yes
		TV Auto Shut off Function	Yes
		End Call	No
		Index Search	No
		SQPB	No
		CATV	Yes
		CM Skip(30sec x 6 Times)	Yes
		Comb Filter	No
		TV Monitor	No
		Program Extend	No
		Choke Coil	No
		Energy Star	Yes
		Dirty Head	No
		V-chip USA V-chip	Yes
		CANADA V-chip	No
		CM Advance	No
		Movie Advance	No
		Zero Return	Yes
		Power On Memory	No
		Protect of FBT Leak Circuit	Yes
G-14	Accessories	Owner's Manual Language	English
		w/Guarantee Card	Yes
		Remote Control Unit	Yes
		Battery	Yes
		UM size x pcs	UM-4 x 2 pcs
		OEM Brand	No
		Rod Antenna	No
		Poles	-
		Terminal	-
		Loop Antenna	No
		Terminal	-
		U/V Mixer	No
		300 ohm to 75 ohm Antenna Adapter	Yes
		Antenna Change Plug	No
		DC Car Cord (Center+)	No
		AC Plug Adapter	No
		AC Cord	No
		AV Cord (2Pin-1Pin)	No
		Guarantee Card	No
		Registration Card	Yes
		ESP Card	Yes
		Warning Sheet	No
		Dew/AHC Caution Sheet	No
		Quick Set-up Sheet	No
		Circuit Diagram	No
		Service Facility List	No
		Important Safeguard	No

GENERAL SPECIFICATIONS

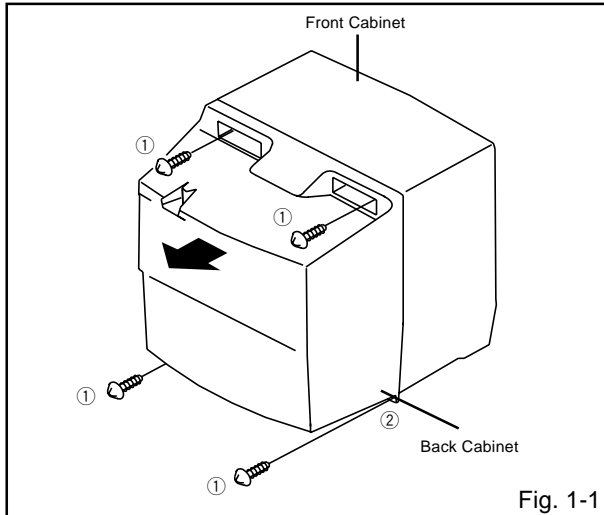
G-15	Interface	Switch	Power	Yes
			Play	Yes
			Pause/Still	No
			One Touch Playback	No
			Channel Up	Yes
			Channel Down	Yes
			F.FWD/Cue	Yes
			Eject/Stop	Yes
			Main Power SW	No
			Volume Up	Yes
			Volume Down	Yes
			Rew/Rev	Yes
			Rec/OTR	Yes
			Input Select	No
		Indicator	Power	No
			Rec/OTR	Yes (Red)
			T-Rec	Yes (Red)
			On Timer	No
		Key Light up	CS	No
			Rec/OTR	No
			One Touch Playback	No
		Terminals	Play	No
			Front	Video Input
			Audio Input	RCA x 1
			Other Terminal	RCA x 1
				Head Phone(Stereo & Mono, 3.5mm)
			Rear	Video Input
			Audio Input	No
			Video Output	No
			Audio Output	No
			Euro Scart	No
			Diversity	No
			Ext Speaker	No
			DC Jack 12V(Center +)	No
			VHF/UHF Antenna Input	F Type
			AC Inlet	No
G-16	Set Size	Approx. W x D x H (mm)		362 x 365 x 382
G-17	Weight	Net (Approx.)		11.0 kg(24.3 lbs)
		Gross (Approx.)		12.5 kg(27.6 lbs)
G-18	Carton	Master Carton		No
			Content	-
			Material	-
			Dimensions W x D x H(mm)	-
			Description of Origin	-
		Gift Box		Yes
			Material	Double/Full color
			Dimensions W x D x H(mm)	423 x 447 x 443
			Design	As per Buyer's
			Description of Origin	Yes
		Drop Test	Natural Dropping At	1 Corner / 3 Edges / 6 Surfaces
			Height (cm)	62
		Container Stuffing(40' container)		700 Sets
G-19	Material	Cabinet	Front	PS 94V0 DECABROM
			Rear	PS 94V0 DECABROM
			Jack Panel	-
		PCB	Non-Halogen Demand	No
			Eyelet Demand	Yes

DISASSEMBLY INSTRUCTIONS

1. REMOVAL OF MECHANICAL PARTS AND P.C. BOARDS

1-1: BACK CABINET (Refer to Fig. 1-1)

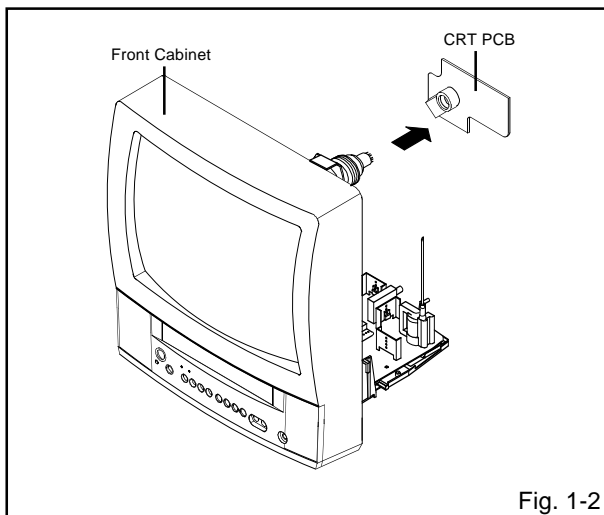
1. Remove the 4 screws ①.
2. Remove the AC cord from the AC cord hook ②.
3. Remove the Back Cabinet in the direction of arrow.



1-2: CRT PCB (Refer to Fig. 1-2)

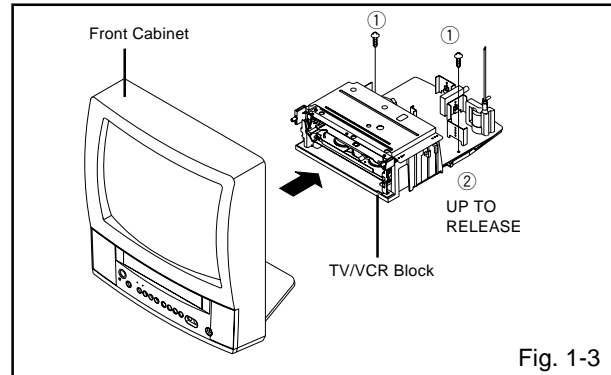
CAUTION: BEFORE REMOVING THE ANODE CAP, DISCHARGE ELECTRICITY BECAUSE IT CONTAINS HIGH VOLTAGE. BEFORE ATTEMPTING TO REMOVE OR REPAIR ANY PCB, UNPLUG THE POWER CORD FROM THE AC SOURCE.

1. Remove the Anode Cap.
(Refer to REMOVAL OF ANODE CAP)
2. Disconnect the following connectors:
(CP801 and CP851B).
3. Remove the CRT PCB in the direction of arrow.



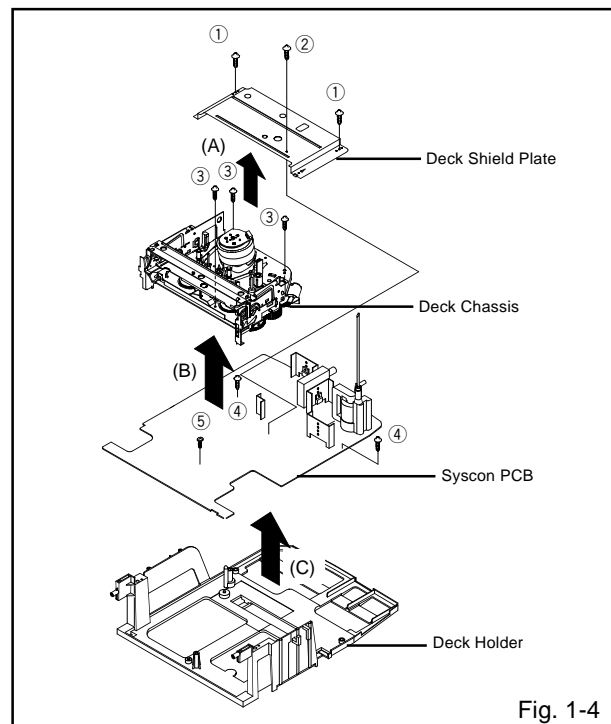
1-3: TV/VCR BLOCK (Refer to Fig. 1-3)

1. Remove the 2 screws ①.
2. Disconnect the following connectors:
(CP352, CP401 and CP502).
3. Unlock the support ②.
4. Remove the TV/VCR Block in the direction of arrow.



1-4: DECK CHASSIS AND SYSCON PCB (Refer to Fig. 1-4)

1. Remove the 2 screws ①.
2. Remove the screw ②.
3. Remove the 3 screws ③.
4. Remove the Deck Shield Plate in direction of arrow (A).
5. Remove the 2 screws ④.
6. Disconnect the following connectors:
(CP1001, CP4001, CP4002 and CP4003).
7. Remove the Deck Chassis in the direction of arrow (B).
8. Remove the screw ⑤.
9. Remove the Syscon PCB in the direction of arrow (C).



DISASSEMBLY INSTRUCTIONS

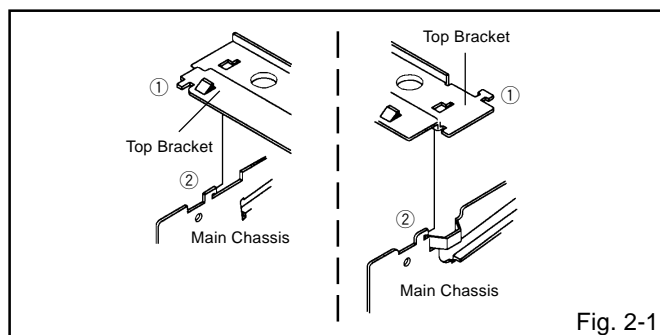
2. REMOVAL OF VCR DECK PARTS

2-1: TOP BRACKET (Refer to Fig. 2-1)

1. Extend the 2 supports ①.
2. Slide the 2 supports ② and remove the Top Bracket.

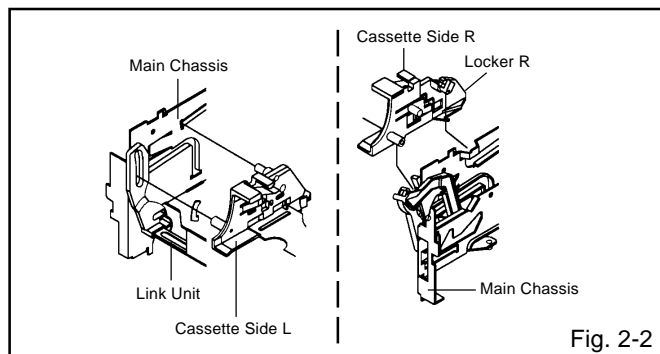
NOTE

1. After the installation of the Top Bracket, bend the support ① so that the Top Bracket is fixed.



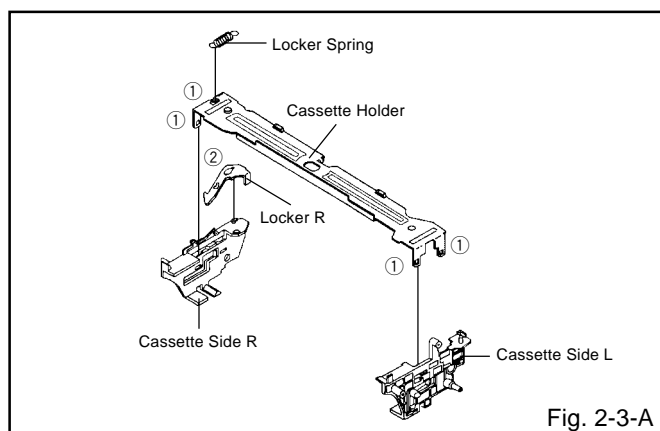
2-2: CASSETTE HOLDER ASS'Y (Refer to Fig. 2-2)

1. Move the Cassette Holder Ass'y to the front side.
2. Push the Locker R to remove the Cassette Side R.
3. Remove the Cassette Side L.



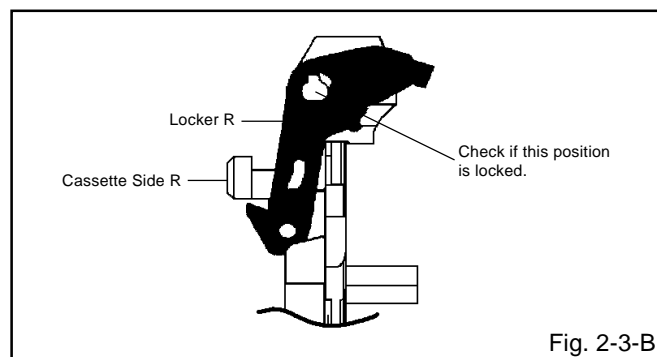
2-3: CASSETTE SIDE L/R (Refer to Fig. 2-3-A)

1. Remove the Locker Spring.
2. Unlock the 4 supports ① and then remove the Cassette Side L/R.
3. Unlock the support ② and then remove the Locker R.



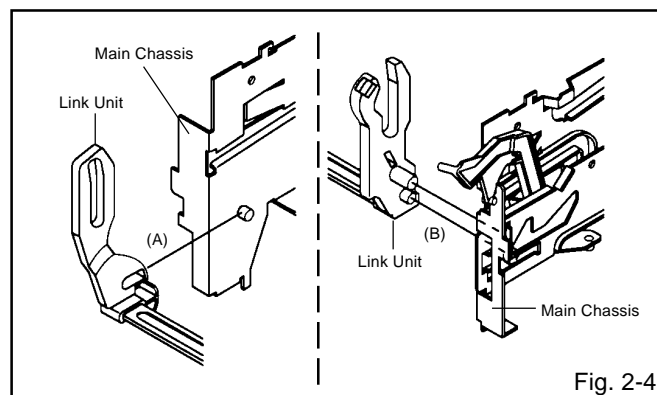
NOTE

1. In case of the Locker R installation, check if the one position of Fig.2-3-B are correctly locked.
2. When you install the Cassette Side R, be sure to move the Locker R after installing.



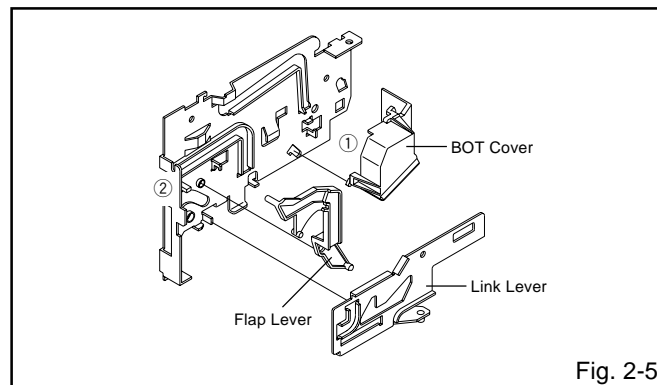
2-4: LINK UNIT (Refer to Fig. 2-4)

1. Set the Link Unit to the Eject position.
2. Unlock the support ①.
3. Remove the (A) side of the Link Unit first, then remove the (B) side.



2-5: LINK LEVER/FLAP LEVER/BOT COVER (Refer to Fig. 2-5)

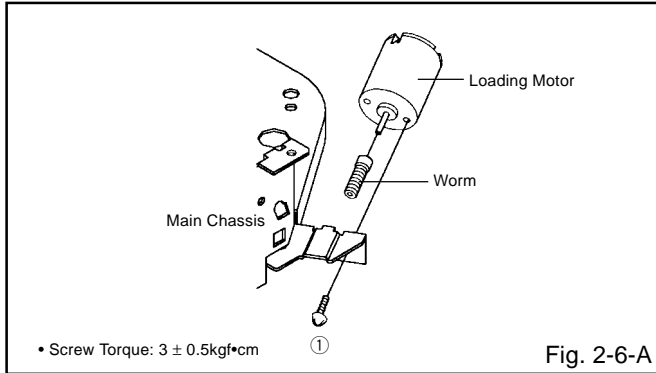
1. Unlock the support ①.
2. Remove the BOT Cover.
3. Extend the support ②.
4. Remove the Link Lever.
5. Remove the Flap Lever.



DISASSEMBLY INSTRUCTIONS

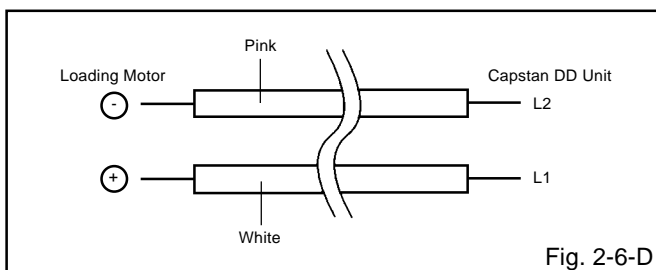
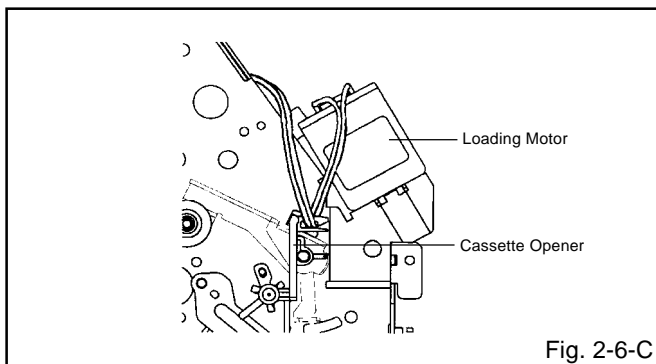
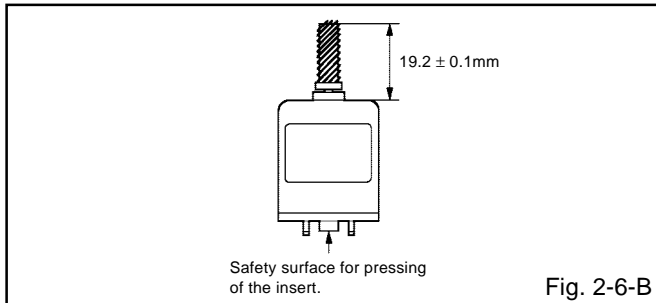
2-6: LOADING MOTOR/WORM (Refer to Fig. 2-6-A)

1. Remove the screw ①.
2. Remove the Loading Motor.
3. Remove the Worm.



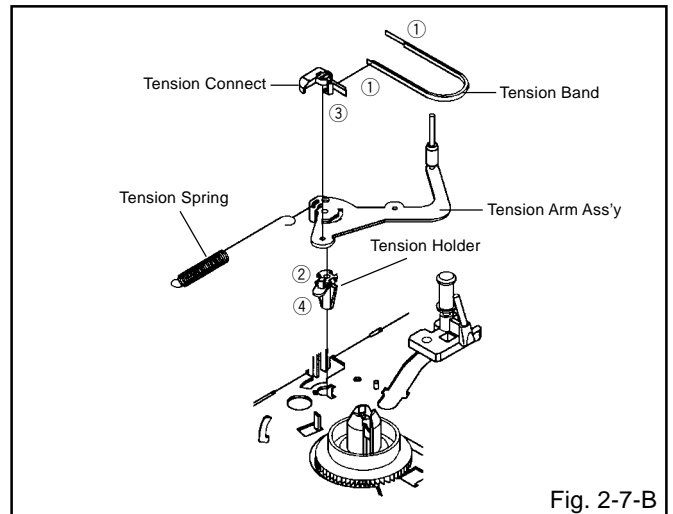
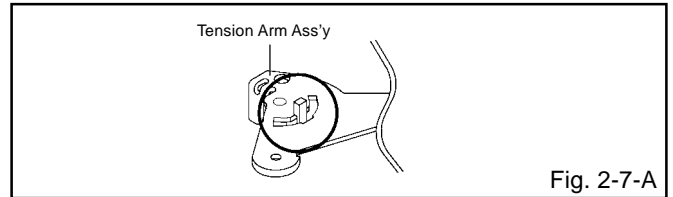
NOTE

1. In case of the Worm installation, check if the value of the Fig. 2-6-B is correct.
2. In case of the Loading Motor installation, hook the wire on the Cassette Opener as shown Fig. 2-6-C.
3. When installing the wires between Capstan DD Unit and Loading Motor, connect them correctly as shown Fig. 2-6-D.



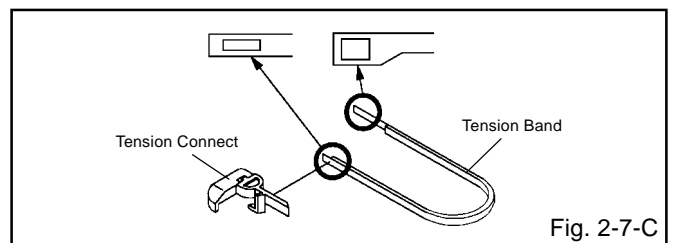
2-7: TENSION ASS'Y (Refer to Fig. 2-7-B)

1. Turn the Pinch Roller Cam clockwise so that the Tension Holder hook is set to the position of Fig. 2-7-A to move the Tension Arm Ass'y.
2. Remove the Tension Spring.
3. Unlock the 2 supports ① and remove the Tension Band.
4. Unlock the support ② and remove the Tension Arm Ass'y.
5. Unlock the support ③ and remove the Tension Connect.
6. Float the hook ④ and turn it clockwise then remove the Tension Holder.

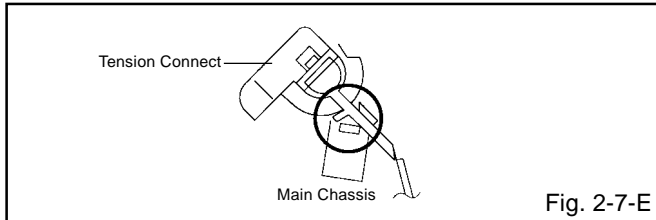
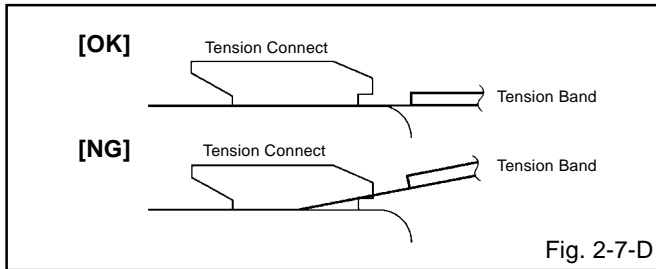


NOTE

1. In case of the Tension Band installation, note the direction of the installation. (Refer to Fig. 2-7-C)
2. In case of the Tension Band installation, install correctly as Fig. 2-7-D.
3. In case of the Tension Connect installation, install as the circled section of Fig. 2-7-E.

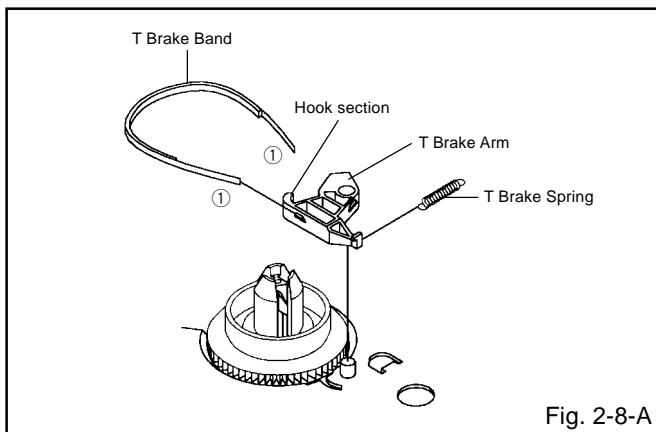


DISASSEMBLY INSTRUCTIONS



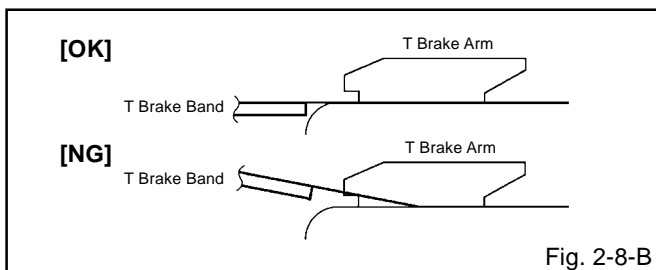
2-8: T BRAKE ARM/T BRAKE BAND (Refer to Fig. 2-8-A)

1. Remove the T Brake Spring.
2. Turn the T Brake Arm clockwise and bend the hook section to remove it.
3. Unlock the 2 supports ① and remove the T Brake Band.



NOTE

1. In case of the T Brake Band installation, install correctly as Fig. 2-8-B.

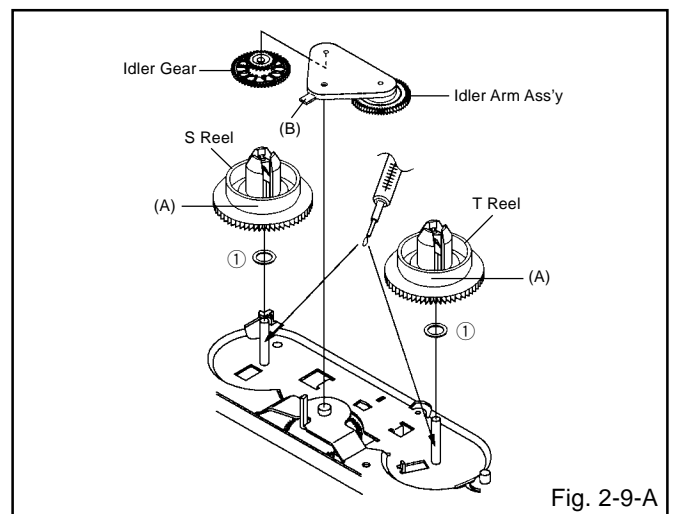


2-9: S REEL/T REEL/IDLER ARM ASS'Y/IDLER GEAR (Refer to Fig. 2-9-A)

1. Remove the S Reel and T Reel.
2. Remove the 2 Polyslider Washers ①.
3. Remove the Idler Arm Ass'y and Idler Gear.

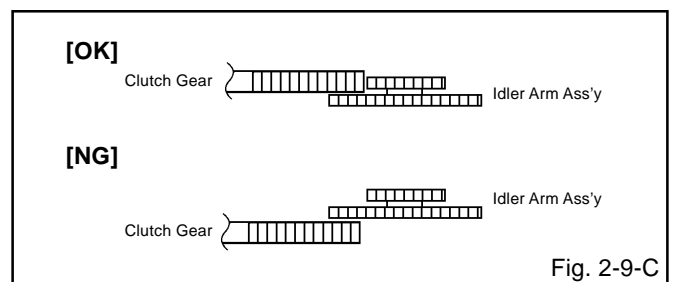
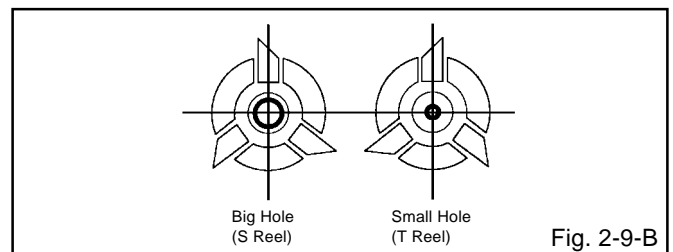
NOTE

1. Take care not to damage the gears of the S Reel and T Reel.
2. The Polyslider Washer may be remained on the back of the reel.
3. Take care not to damage the shaft.
4. Do not touch the section "A" of S Reel and T Reel. (Use gloves.) (Refer to Fig. 2-9-A) Do not adhere the stains on it.
5. When you install the reel, clean the shaft and grease it. (If you do not grease, noise may be heard in FF/REW mode.)
6. After installing the reel, adjust the height of the reel. (Refer to MECHANICAL ADJUSTMENT)



NOTE

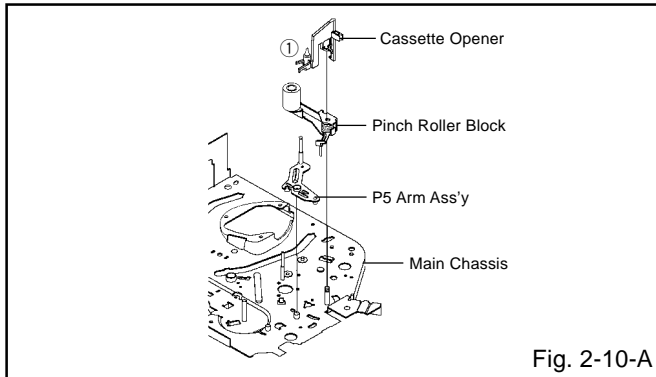
1. In case of the S Reel and T Reel installation, check if the correct parts are installed. (Refer to Fig. 2-9-B)
2. In case of the Idler Arm Ass'y installation, install correctly as Fig. 2-9-C. And also set it so that the section "B" of Fig. 2-9-A is placed under the Main Chassis tab.



DISASSEMBLY INSTRUCTIONS

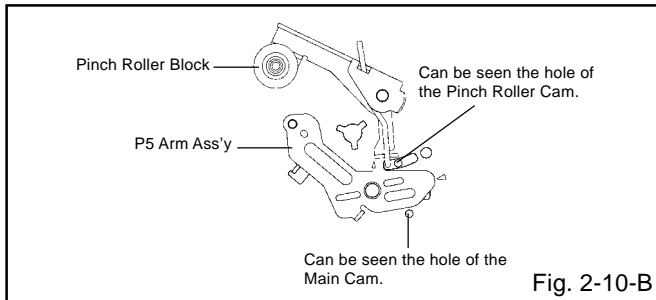
2-10: CASSETTE OPENER/PINCH ROLLER BLOCK/P5 ARM ASS'Y (Refer to Fig. 2-10-A)

1. Unlock the support ① and remove the Cassette Opener.
2. Remove the Pinch Roller Block and P5 Arm Ass'y.



NOTE

1. Do not touch the Pinch Roller. (Use gloves.)
2. In case of the Pinch Roller Block and the Pinch Roller Cam installation, install correctly as Fig. 2-10-B.

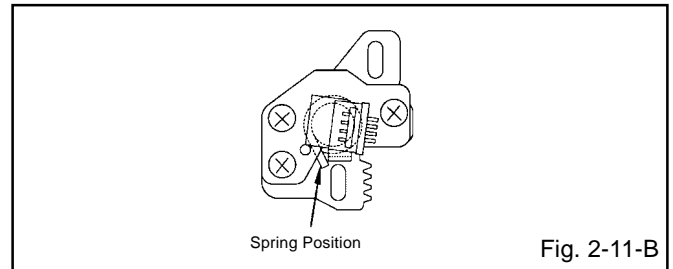
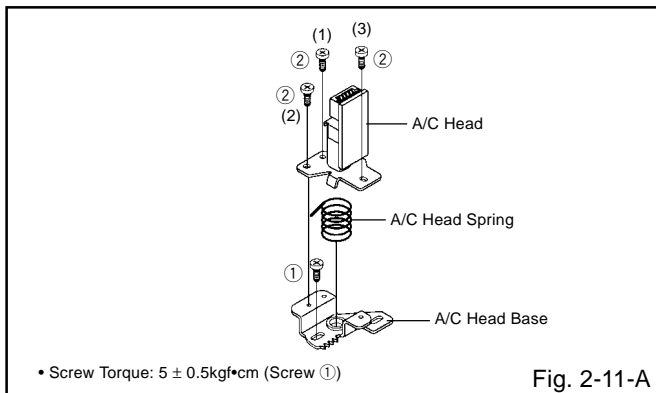


2-11: A/C HEAD (Refer to Fig. 2-11-A)

1. Remove the screw ①.
2. Remove the A/C Head Base.
3. Remove the 3 screws ②.
4. Remove the A/C Head and A/C Head Spring.

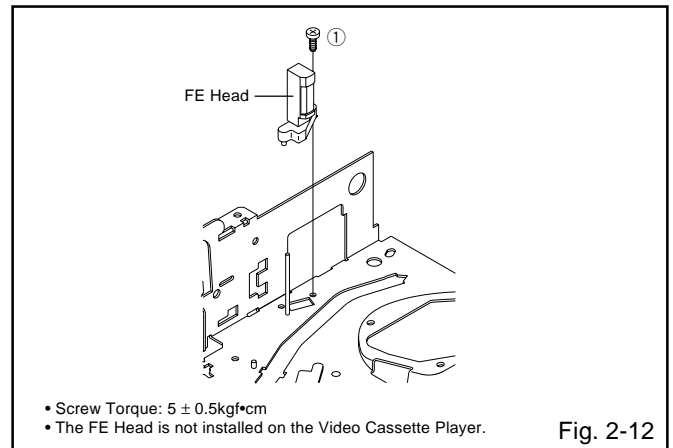
NOTE

1. Do not touch the A/C Head. (Use gloves.)
2. When you install the A/C Head Spring, install as shown in Fig. 2-11-B.
3. When you install the A/C Head, tighten the screw (1) first, then tighten the screw (2), finally tighten the screw (3).



2-12: FE HEAD (RECORDER ONLY) (Refer to Fig. 2-12)

1. Remove the screw ①.
2. Remove the FE Head.

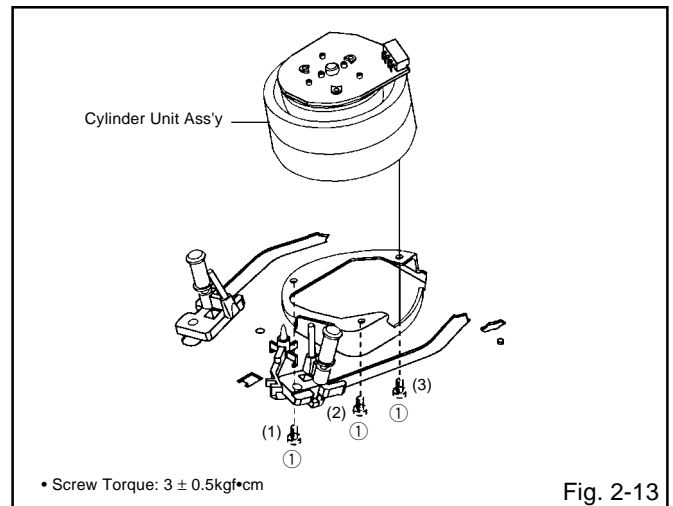


2-13: CYLINDER UNIT ASS'Y (Refer to Fig. 2-13)

1. Disconnect the following connector: (CD2001)
2. Remove the 3 screws ①.
3. Remove the Cylinder Unit Ass'y.

NOTE

1. When you install the Cylinder Unit Ass'y, tighten the screws from (1) to (3) in order while pulling the Ass'y toward the left front direction.



DISASSEMBLY INSTRUCTIONS

2-14: CAPSTAN DD UNIT (Refer to Fig. 2-14-A)

1. Remove the Capstan Belt.
2. Remove the 3 screws ①.
3. Remove the Capstan DD Unit.

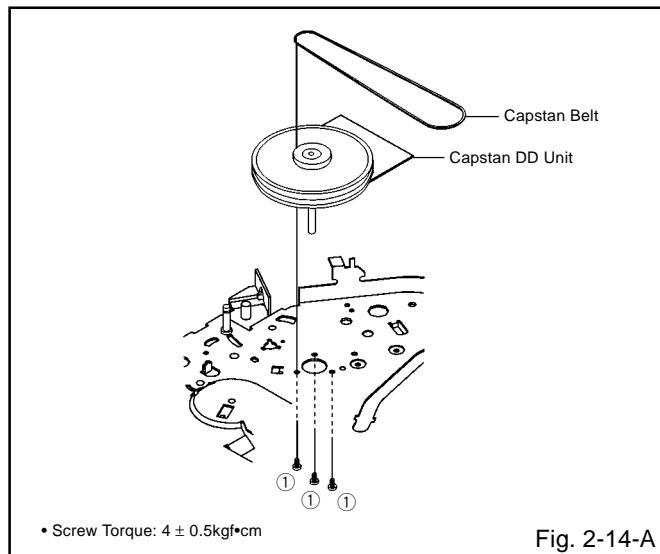


Fig. 2-14-A

NOTE

1. In case of the Capstan DD Unit installation, apply the silicon bond (TSE3843-W) on the position Fig. 2-14-B correctly. (If no silicon bond applied, abnormal noise will be heard on the deck operation.)
(Refer to Fig. 2-14-B, C)

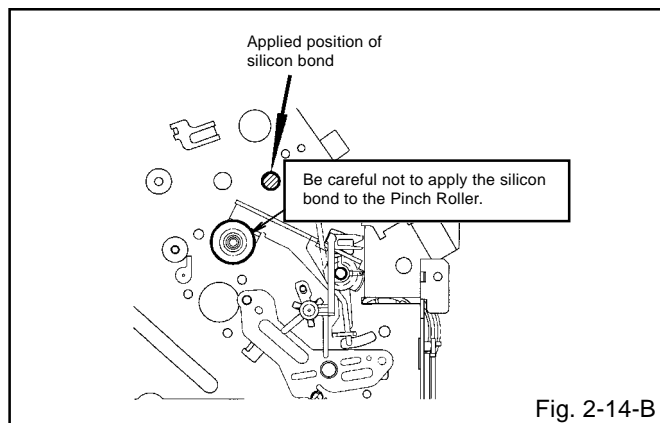


Fig. 2-14-B

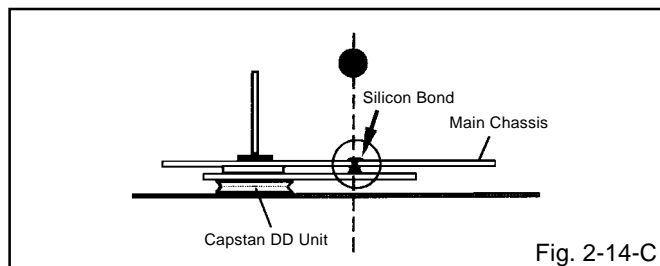


Fig. 2-14-C

2-15: MAIN CAM/PINCH ROLLER CAM/JOINT GEAR (Refer to Fig. 2-15-A)

1. Remove the E-Ring ①, then remove the Main Cam.
2. Remove the E-Ring ②, then remove the Pinch Roller Cam and Joint Gear.

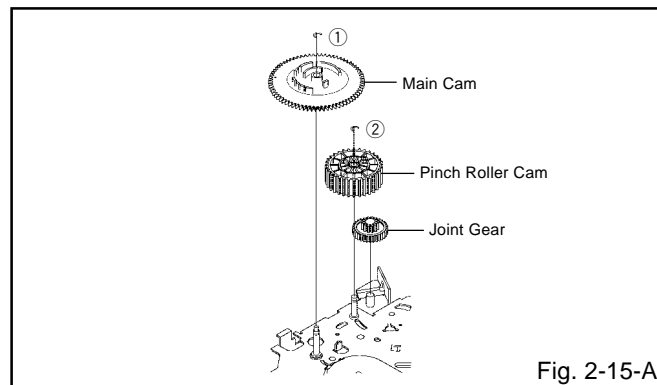


Fig. 2-15-A

NOTE

1. In case of the Pinch Roller Cam and Main Cam installation, install them as the circled section of Fig. 2-15-B so that the each markers are met. (Refer to Fig. 2-15-B) And also can be seen the Main Chassis hole through the Main Cam maker hole.

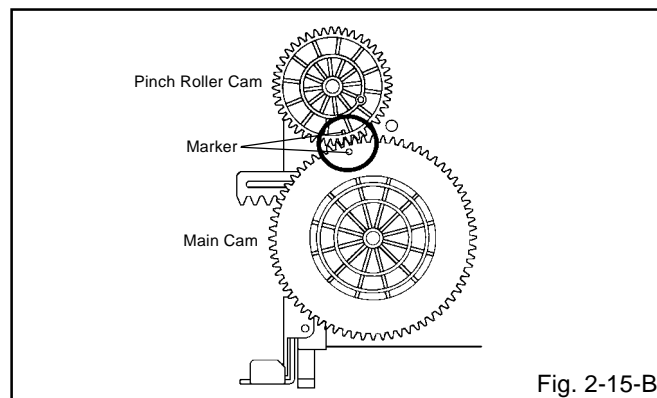


Fig. 2-15-B

2-16: LOADING GEAR S/T UNIT (Refer to Fig. 2-16-A)

1. Remove the E-Ring ① and remove the Main Loading Gear.
2. Remove the Main Rod, Tension Lever, Loading Arm S Unit and Loading Arm T Unit.

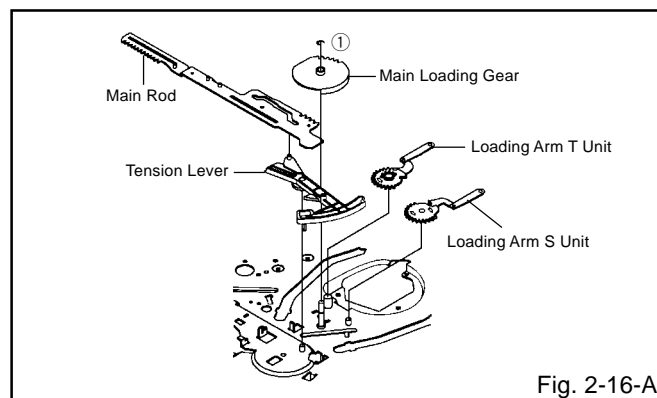
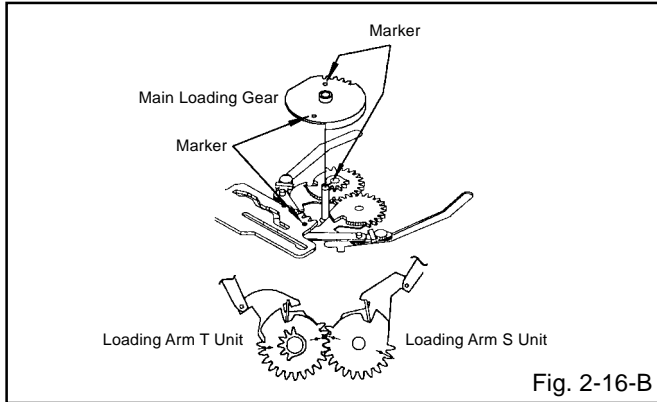


Fig. 2-16-A

DISASSEMBLY INSTRUCTIONS

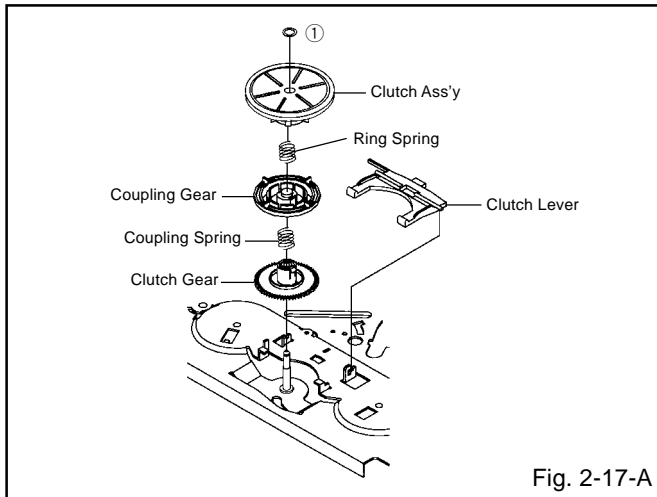
NOTE

1. When you install the Loading Arm S Unit, Loading Arm T Unit and Main Loading Gear, align each marker. (Refer to Fig. 2-16-B)



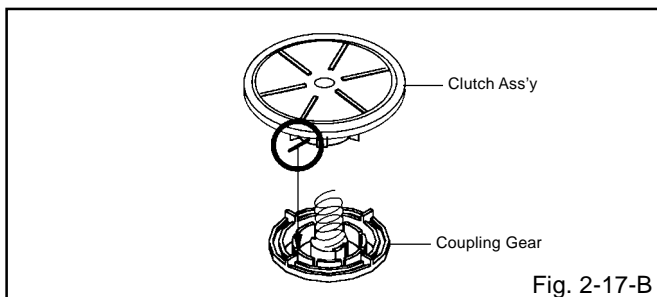
2-17: CLUTCH ASS'Y/RING SPRING/CLUTCH LEVER/CLUTCH GEAR (Refer to Fig. 2-17-A)

1. Remove the Polyslider Washer ①.
2. Remove the Clutch Ass'y and Ring Spring.
3. Remove the Clutch Lever.
4. Remove the Coupling Gear, Coupling Spring and Clutch Gear.



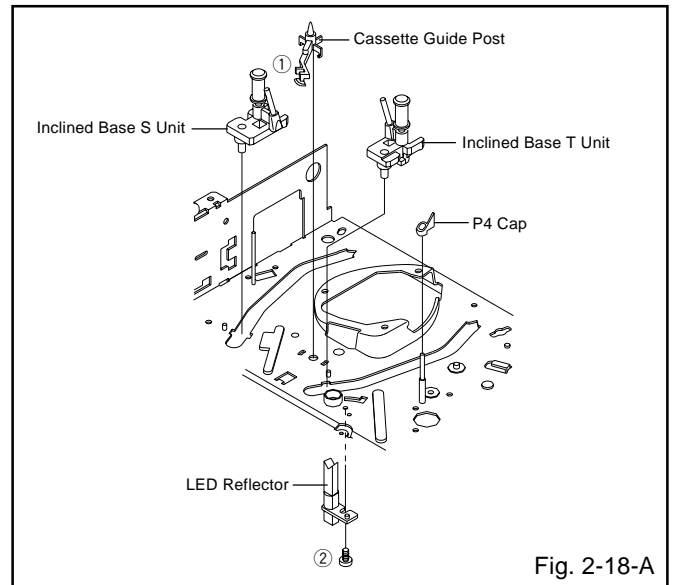
NOTE

1. In case of the Clutch Ass'y installation, install it with inserting the spring of the Clutch Ass'y into the dent of the Coupling Gear. (Refer to Fig. 2-17-B)



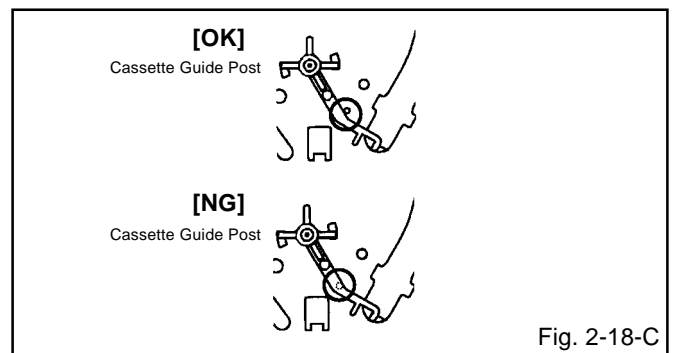
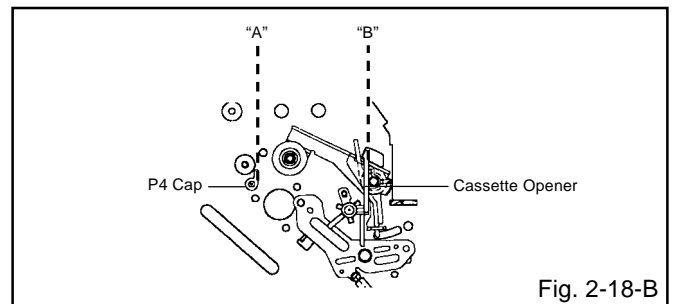
2-18: CASSETTE GUIDE POST/INCLINED BASE S/T UNIT/P4 CAP/LED REFLECTOR (Refer to Fig. 2-18-A)

1. Remove the P4 Cap.
2. Unlock the support ① and remove the Cassette Guide Post.
3. Remove the Inclined Base S/T Unit.
4. Remove the screw ②.
5. Remove the LED Reflector.



NOTE

1. Do not touch the roller of Guide Roller.
2. In case of the P4 Cap installation, install it with parallel for "A" and "B" of Fig. 2-18-B.
3. In case of the Cassette Guide Post installation, install correctly as the circled section of Fig. 2-18-C.



DISASSEMBLY INSTRUCTIONS

3. REMOVAL OF ANODE CAP

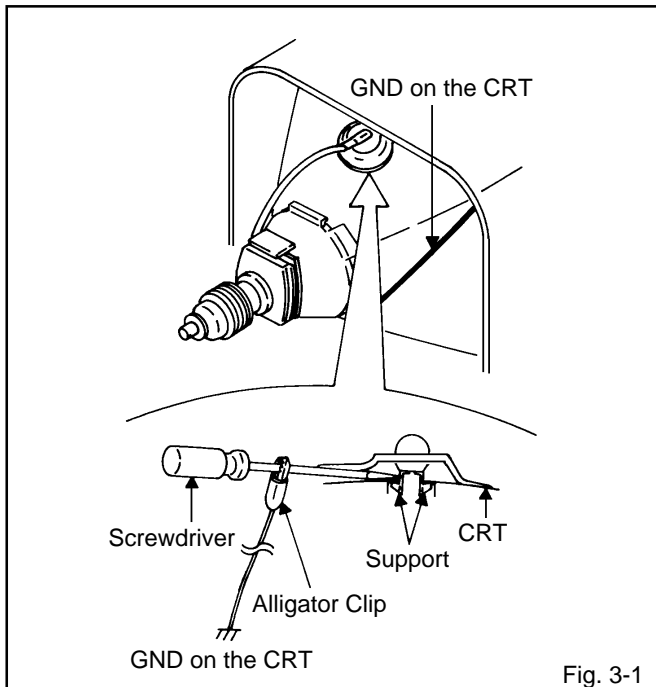
Read the following **NOTED** items before starting work.

- * After turning the power off there might still be a potential voltage that is very dangerous. When removing the Anode Cap, make sure to discharge the Anode Cap's potential voltage.
- * Do not use pliers to loosen or tighten the Anode Cap terminal, this may cause the spring to be damaged.

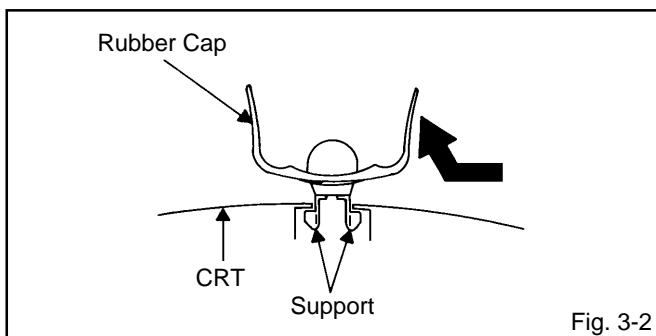
REMOVAL

1. Follow the steps as follows to discharge the Anode Cap.
(Refer to Fig. 3-1.)

Connect one end of an Alligator Clip to the metal part of a flat-blade screwdriver and the other end to ground. While holding the plastic part of the insulated Screwdriver, touch the support of the Anode with the tip of the Screwdriver. A cracking noise will be heard as the voltage is discharged.



2. Flip up the sides of the Rubber Cap in the direction of the arrow and remove one side of the support.
(Refer to Fig. 3-2.)



3. After one side is removed, pull in the opposite direction to remove the other.

NOTE

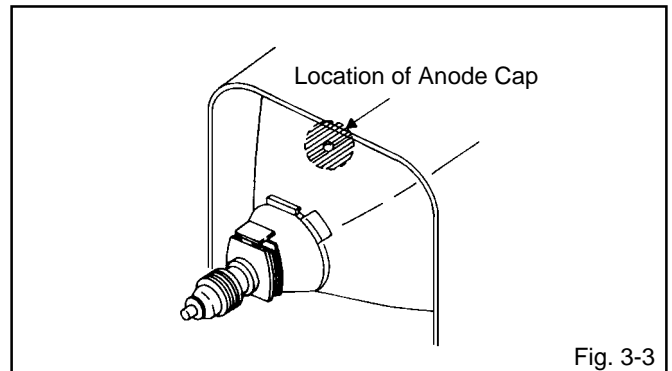
Take care not to damage the Rubber Cap.

INSTALLATION

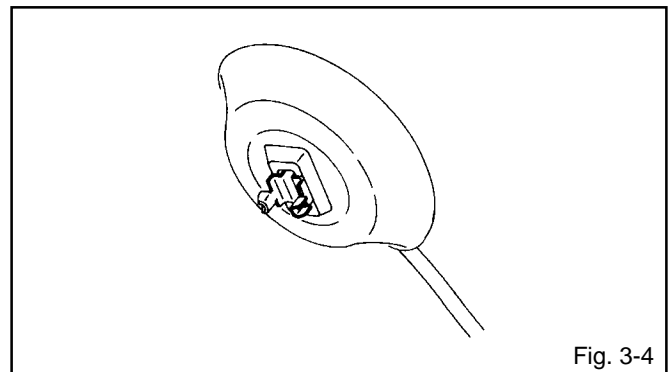
1. Clean the spot where the cap was located with a small amount of alcohol. (Refer to Fig. 3-3.)

NOTE

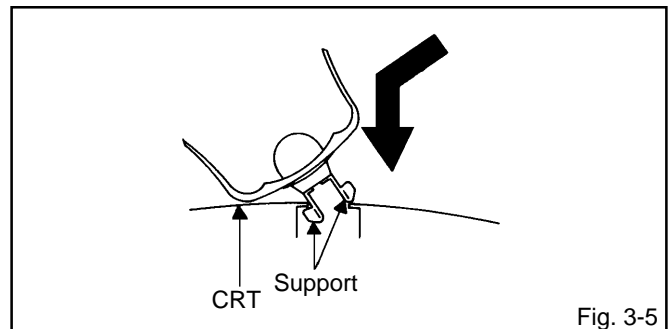
Confirm that there is no dirt, dust, etc. at the spot where the cap was located.



2. Arrange the wire of the Anode Cap and make sure the wire is not twisted.
3. Turn over the Rubber Cap. (Refer to Fig. 3-4.)



4. Insert one end of the Anode Support into the anode button, then the other as shown in Fig. 3-5.



5. Confirm that the Support is securely connected.
6. Put on the Rubber Cap without moving any parts.

DISASSEMBLY INSTRUCTIONS

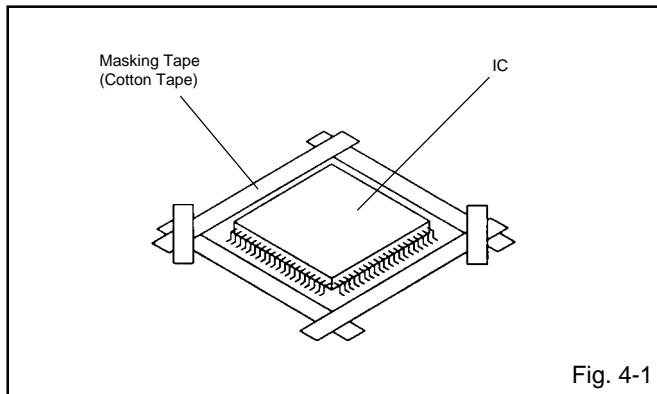
4. REMOVAL AND INSTALLATION OF FLAT PACKAGE IC

REMOVAL

1. Put the Masking Tape (cotton tape) around the Flat Package IC to protect other parts from any damage. (Refer to Fig. 4-1.)

NOTE

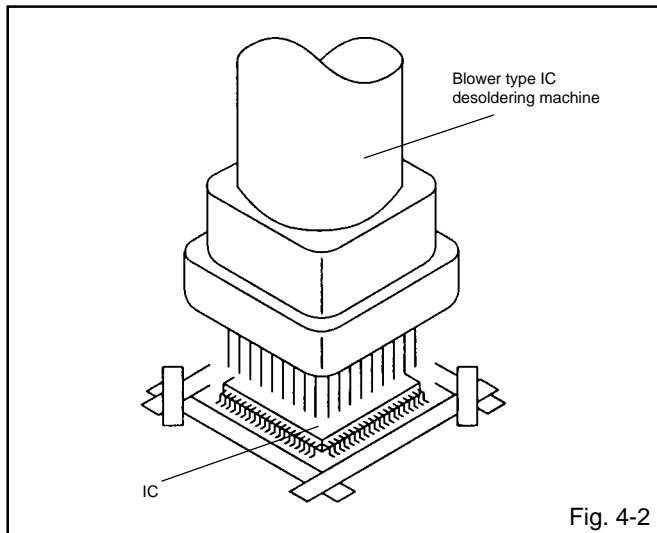
Masking is carried out on all the parts located within 10 mm distance from IC leads.



2. Heat the IC leads using a blower type IC desoldering machine. (Refer to Fig. 4-2.)

NOTE

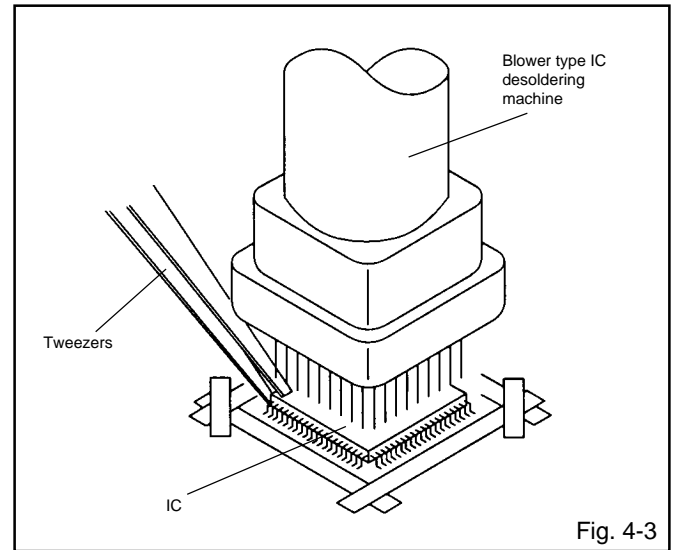
Do not add the rotating and the back and forth directions force on the IC, until IC can move back and forth easily after desoldering the IC leads completely.



3. When IC starts moving back and forth easily after desoldering completely, pickup the corner of the IC using a tweezers and remove the IC by moving with the IC desoldering machine. (Refer to Fig. 4-3.)

NOTE

Some ICs on the PCB are affixed with glue, so be careful not to break or damage the foil of each IC leads or solder lands under the IC when removing it.

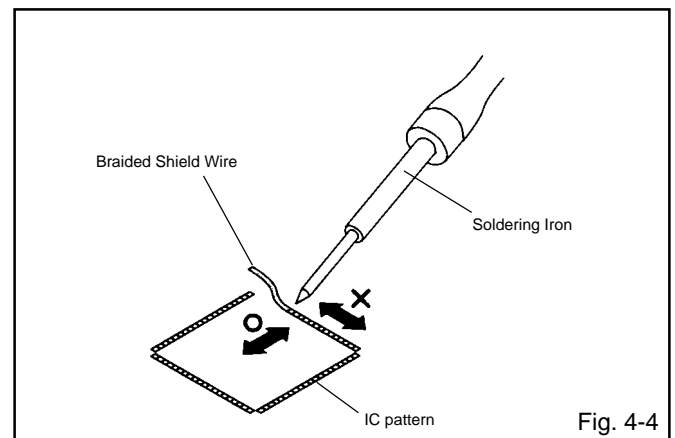


4. Peel off the Masking Tape.

5. Absorb the solder left on the pattern using the Braided Shield Wire. (Refer to Fig. 4-4.)

NOTE

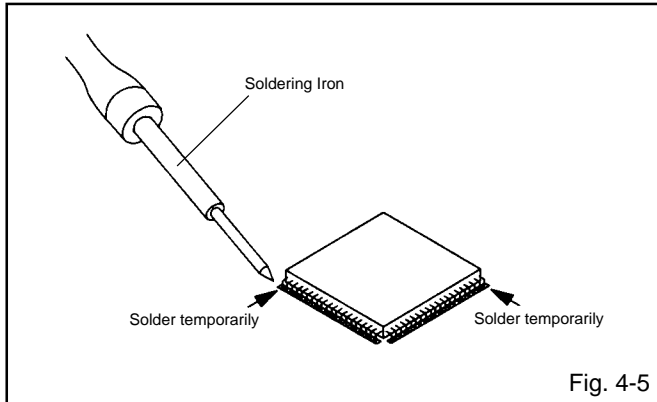
Do not move the Braided Shield Wire in the vertical direction towards the IC pattern.



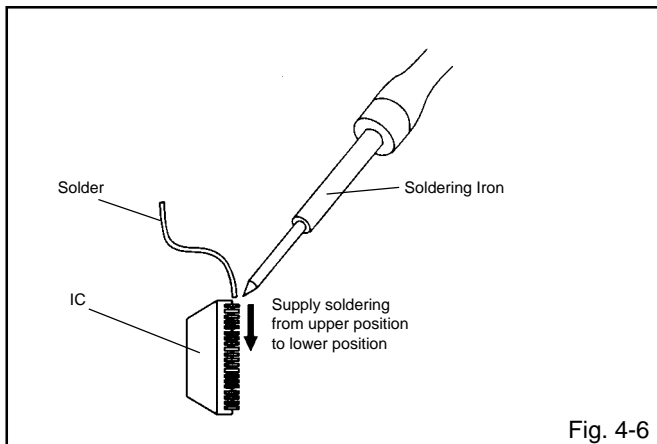
DISASSEMBLY INSTRUCTIONS

INSTALLATION

1. Take care of the polarity of new IC and then install the new IC fitting on the printed circuit pattern. Then solder each lead on the diagonal positions of IC temporarily. (Refer to Fig. 4-5.)



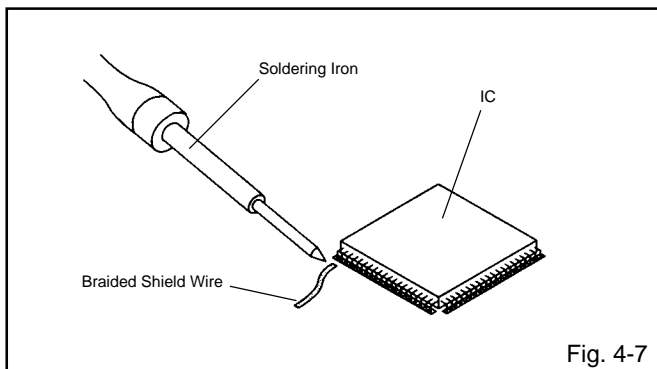
2. Supply the solder from the upper position of IC leads sliding to the lower position of the IC leads. (Refer to Fig. 4-6.)



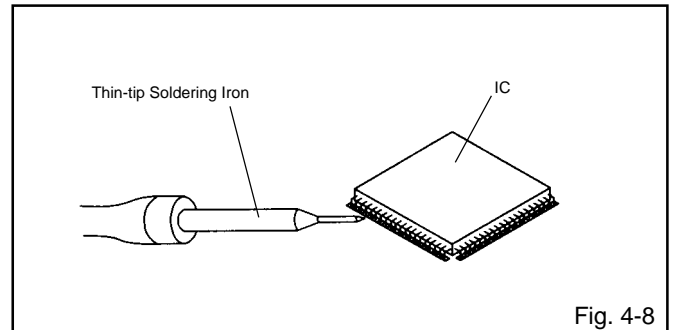
3. Absorb the solder left on the lead using the Braided Shield Wire. (Refer to Fig. 4-7.)

NOTE

Do not absorb the solder to excess.



4. When bridge-soldering between terminals and/or the soldering amount are not enough, resolder using a Thin-tip Soldering Iron. (Refer to Fig. 4-8.)



5. Finally, confirm the soldering status on four sides of the IC using a magnifying glass. Confirm that no abnormality is found on the soldering position and installation position of the parts around the IC. If some abnormality is found, correct by resoldering.

NOTE

When the IC leads are bent during soldering and/or repairing, do not repair the bending of leads. If the bending of leads are repaired, the pattern may be damaged. So, be always sure to replace the IC in this case.

KEY TO ABBREVIATIONS

A	A/C	: Audio/Control	H	H.P.F	: High Pass Filter
	ACC	: Automatic Color Control		H.SW	: Head Switch
	AE	: Audio Erase		Hz	: Hertz
	AFC	: Automatic Frequency Control	I	IC	: Integrated Circuit
	AFT	: Automatic Fine Tuning		IF	: Intermediate Frequency
	AFT DET	: Automatic Fine Tuning Detect		IND	: Indicator
	AGC	: Automatic Gain Control		INV	: Inverter
	AMP	: Amplifier	K	KIL	: Killer
	ANT	: Antenna	L	L	: Left
	A.PB	: Audio Playback		LED	: Light Emitting Diode
	APC	: Automatic Phase Control		LIMIT AMP	: Limiter Amplifier
	ASS'Y	: Assembly		LM, LDM	: Loading Motor
	AT	: All Time		LP	: Long Play
	AUTO	: Automatic		L.P.F	: Low Pass Filter
	A/V	: Audio/Video		LUMI.	: Luminance
B	BGP	: Burst Gate Pulse	M	M	: Motor
	BOT	: Beginning of Tape		MAX	: Maximum
	BPF	: Bandpass Filter		MINI	: Minimum
	BRAKE SOL	: Brake Solenoid		MIX	: Mixer, mixing
	BUFF	: Buffer		MM	: Monostable Multivibrator
	B/W	: Black and White		MOD	: Modulator, Modulation
C	C	: Capacitance, Collector		MPX	: Multiplexer, Multiplex
	CASE	: Cassette		MS SW	: Mecha State Switch
	CAP	: Capstan	N	NC	: Non Connection
	CARR	: Carrier		NR	: Noise Reduction
	CH	: Channel	O	OSC	: Oscillator
	CLK	: Clock		OPE	: Operation
	CLOCK (SY-SE)	: Clock (Syscon to Servo)	P	PB	: Playback
	COMB	: Combination, Comb Filter		PB CTL	: Playback Control
	CONV	: Converter		PB-C	: Playback-Chrominance
	CPM	: Capstan Motor		PB-Y	: Playback-Luminance
	CTL	: Control		PCB	: Printed Circuit Board
	CYL	: Cylinder		P. CON	: Power Control
	CYL-M	: Cylinder-Motor		PD	: Phase Detector
	CYL SENS	: Cylinder-Sensor		PG	: Pulse Generator
D	DATA (SY-CE)	: Data (Syscon to Servo)		P-P	: Peak-to Peak
	dB	: Decibel	R	R	: Right
	DC	: Direct Current		REC	: Recording
	DD Unit	: Direct Drive Motor Unit		REC-C	: Recording-Chrominance
	DEMOD	: Demodulator		REC-Y	: Recording-Luminance
	DET	: Detector		REEL BRK	: Reel Brake
	DEV	: Deviation		REEL S	: Reel Sensor
E	E	: Emitter		REF	: Reference
	EF	: Emitter Follower		REG	: Regulated, Regulator
	EMPH	: Emphasis		REW	: Rewind
	ENC	: Encoder		REV, RVS	: Reverse
	ENV	: Envelope		RF	: Radio Frequency
	EOT	: End of Tape		RMC	: Remote Control
	EQ	: Equalizer		RY	: Relay
	EXT	: External	S	S. CLK	: Serial Clock
F	F	: Fuse		S. COM	: Sensor Common
	FBC	: Feed Back Clamp		S. DATA	: Serial Data
	FE	: Full Erase		SEG	: Segment
	FF	: Fast Forward, Flip-flop		SEL	: Select, Selector
	FG	: Frequency Generator		SENS	: Sensor
	FL SW	: Front Loading Switch		SER	: Search Mode
	FM	: Frequency Modulation		SI	: Serial Input
	FSC	: Frequency Sub Carrier		SIF	: Sound Intermediate Frequency
	FWD	: Forward		SO	: Serial Output
G	GEN	: Generator		SOL	: Solenoid
	GND	: Ground		SP	: Standard Play

KEY TO ABBREVIATIONS

S	STB	:	Serial Strobe
	SW	:	Switch
	SYNC	:	Synchronization
	SYNC SEP	:	Sync Separator, Separation
T	TR	:	Transistor
	TRAC	:	Tracking
	TRICK PB	:	Trick Playback
	TP	:	Test Point
U	UNREG	:	Unregulated
V	V	:	Volt
	VCO	:	Voltage Controlled Oscillator
	VIF	:	Video Intermediate Frequency
	VP	:	Vertical Pulse, Voltage Display
	V.PB	:	Video Playback
	VR	:	Variable Resistor
	V.REC	:	Video Recording
	VSF	:	Visual Search Fast Forward
	VSR	:	Visual Search Rewind
	VSS	:	Voltage Super Source
	V-SYNC	:	Vertical-Synchronization
	VT	:	Voltage Tuning
X	X'TAL	:	Crystal
Y	Y/C	:	Luminance/Chrominance

SERVICE MODE LIST

This unit provided with the following SERVICE MODES so you can repair, examine and adjust easily.

To enter SERVICE MODE, unplug AC cord till lost actual clock time. Then press and hold Vol (-) button of main unit and remocon key simultaneously.

The both pressing of set key and remote control key will not be possible if clock has been set. To reset clock, either unplug AC cord and allow at least 5 seconds before Power On.

Set Key	Remocon Key	Operations
VOL. (-) MIN	0	Releasing of V-CHIP PASSWORD.
VOL. (-) MIN	1	Initialization of the factory. NOTE: Do not use this for the normal servicing. If you set a factory initialization, the memories are reset such as the clock setting, the channel setting, the POWER ON total hours, and PLAY/REC total hours.
VOL. (-) MIN	2	Horizontal position adjustment of OSD. NOTE: Also can be adjusted by using the Adjustment MENU. Refer to the "ELECTRICAL ADJUSTMENT" (OSD HORIZONTAL).
VOL. (-) MIN	3	Adjust the PG SHIFTER automatically. Refer to the "ELECTRICAL ADJUSTMENT" (PG SHIFTER).
VOL. (-) MIN	4	Adjust the PG SHIFTER manually. Refer to the "ELECTRICAL ADJUSTMENT" (PG SHIFTER).
VOL. (-) MIN	5	Adjusting of the Tracking to the center position.
VOL. (-) MIN	6	POWER ON total hours and PLAY/REC total hours are displayed on the screen. Refer to the "PREVENTIVE CHECKS AND SERVICE INTERVALS" (CONFIRMATION OF HOURS USED). Can be checked of the INITIAL DATA of MEMORY IC. Refer to the "WHEN REPLACING EEPROM (MEMORY) IC".
VOL. (-) MIN	8	Writing of EEPROM initial data. NOTE: Do not use this for the normal servicing.
VOL. (-) MIN	9	Display of the Adjustment MENU on the screen. Refer to the "ELECTRICAL ADJUSTMENT" (On-Screen Display Adjustment).

Method	Operations
Make the short circuit between the test point of SERVICE and the GND.	The BOT, EOT, and the Reel Sensor do not work and the deck can be operated without a cassette tape. Refer to the "PREPARATION FOR SERVICING"

PREVENTIVE CHECKS AND SERVICE INTERVALS

The following standard table depends on environmental conditions and usage.

Parts replacing time does not mean the life span for individual parts.

Also, long term storage or misuse may cause transformation and aging of rubber parts.

The following list means standard hours, so the checking hours depends on the conditions.

Time Parts Name	500 hours	1,000 hours	1,500 hours	2,000 hours	2,500 hours	Notes
Audio Control Head	■	■	■	●	●	Clean those parts in contact with the tape.
Full Erase Head (Recorder only)	■	■	■	●	●	
Capstan Belt		●	●	●	●	Clean the rubber, and parts which the rubber touches.
Pinch Roller	■	●	●	●	●	
Capstan DD Unit		●	●	●	●	
Loading Motor					●	
Tension Band		●	●	●	●	
T Brake Band		●	●	●	●	
Clutch Ass'y		●	●	●	●	
Idler Arm Ass'y		●	●	●	●	
Capstan Shaft	■	■	■	■	■	
Tape Running Guide Post	■	■	■	■	■	Replace when rolling becomes abnormal.
Cylinder Unit	■	●	●	●	●	Clean the Head

■ : Clean

● : Check it and if necessary, replace it.

CONFIRMATION OF HOURS USED

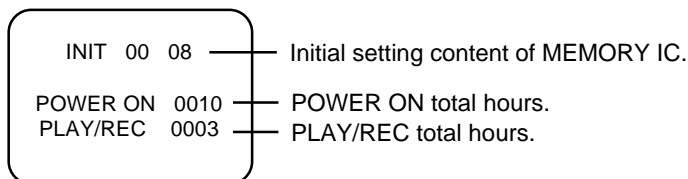
POWER ON total hours and PLAY/REC total hours can be checked on the screen.

Total hours are displayed in 16 system of notation.

NOTE: If you set a factory initialization, the total hours is reset to "0".

The confirmation of using hours will not be possible if clock has been set. To reset clock, either unplug AC cord and allow at least 5 seconds before Power On.

1. Set the VOLUME to minimum.
2. Press both VOL. DOWN button on the set and the Channel button (6) on the remote control simultaneously.
3. After the confirmation of using hours, turn off the power.



(16 x 16 x 16 x thousands digit value) + (16 x 16 x hundreds digit value) + (16 x tens digit value) + (ones digit value)

PREVENTIVE CHECKS AND SERVICE INTERVALS

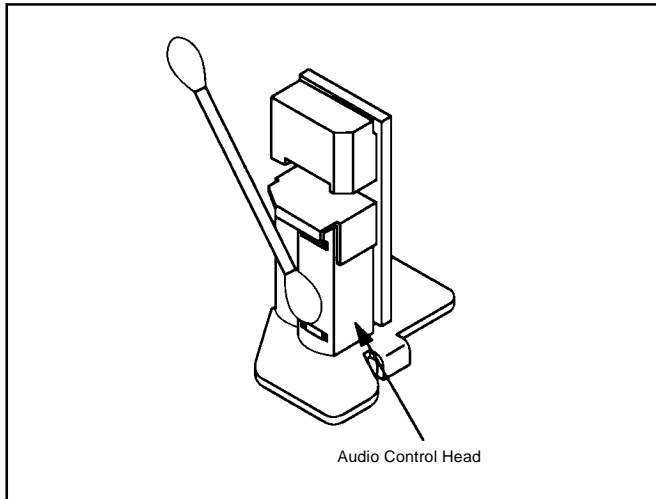
CLEANING

NOTE

After cleaning the heads with isopropyl alcohol, do not run a tape until the heads dry completely. If the heads are not completely dry and alcohol gets on the tape, damage may occur.

1. AUDIO CONTROL HEAD

Clean the Audio Control Head with the cotton stick soaked by alcohol. Clean the full erase head in the same manner. **(Refer to the figure below.)**



2. TAPE RUNNING SYSTEM

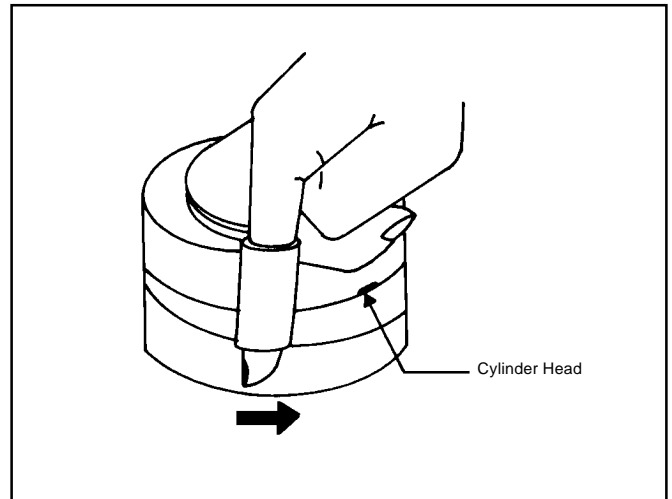
When cleaning the tape transport system, use the gauze moistened with isopropyl alcohol.

3. CYLINDER

Wrap a piece of chamois around your finger. Dip it in isopropyl alcohol. Hold it to the cylinder head softly. Turn the cylinder head counterclockwise to clean it (in the direction of the arrow). **(Refer to the figure below.)**

NOTE

Do not exert force against the cylinder head. Do not move the chamois upward or downward on the head. Use the chamois one by one.



WHEN REPLACING EEPROM (MEMORY) IC

If a service repair is undertaken where it has been required to change the MEMORY IC, the following steps should be taken to ensure correct data settings while making reference to TABLE 1.

NOTE: No need setting for after INI 2F due to the adjustment value.

INI	+0	+1	+2	+3	+4	+5	+6	+7	+8	+9	+A	+B	+C	+D	+E	+F
00	08	0A	70	6B	C2	B3	24	A9	51	2C	00	06	00	40	00	10
10	B2	9A	92	93	00	11	31	05	08	85	A9	0F	94	45	06	14
20	06	3A	01	25	54	60	23	3B	DA	D7	00	00	00	00	00	00

Table 1

1. Enter DATA SET mode by setting VOLUME to minimum.
2. While holding down VOLUME button on front cabinet, press key 6 on remote control.
ADDRESS and DATA should appear as FIG 1.

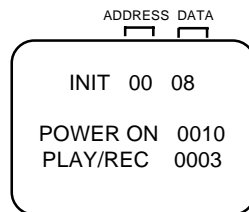


Fig. 1

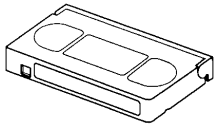
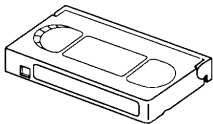
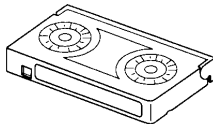
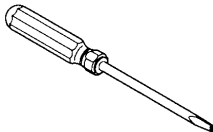
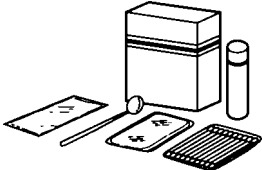


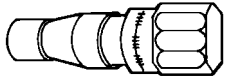
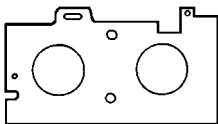
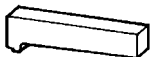
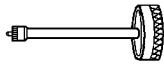
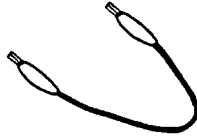
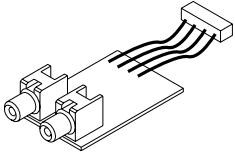
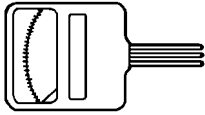
3. ADDRESS is now selected and should "blink". Using the SET +/- button on the remote, step through the ADDRESS until required ADDRESS to be changed is reached.
4. Press ENTER to select DATA. When DATA is selected, it will "blink".
5. Again, step through the DATA using SET +/- button until required DATA value has been selected.
6. Pressing ENTER will take you back to ADDRESS for further selection if necessary.
7. Repeat steps 3 to 6 until all data has been checked.
8. When satisfied correct DATA has been entered, turn POWER off (return to STANDBY MODE) to finish DATA input.

After the data input, set to the initializing of shipping.

9. Turn POWER on.
10. While holding down VOLUME button on front cabinet, press key 1 on remote control.
11. After the finishing of the initializing of shipping, the unit will turn off automatically.

The unit will now have the correct DATA for the new MEMORY IC.

SERVICING FIXTURES AND TOOLS

<p>Alignment Tape</p>  <p>ST-N5 ST-NF</p>	<p>Back tension cassette gauge</p>  <p>70909103</p>	<p>Torque cassette gauge (KT-300NR)</p>  <p>70909199</p>	<p>Taper nut driver</p>  <p>70909228</p>
<p>VTR cleaning kit</p> 	<p>VTR lubrication kit</p> 	<p>Grease</p> 	<p>JG002B Adapter JG002E Dial Torque Gauge (10~90gf•cm) JG002F (60~600gf•cm)</p> 
<p>JG022 Master Plane</p> 	<p>JG024A Reel Disk Height Adjustment Jig</p> 	<p>JG153 X Value Adjustment Screwdriver</p> 	<p>JG154 Cable</p> 
<p>JG180 AV Jack Jig</p> 	<p>Tentelometer</p> 		

Ref. No.	Part No.	Parts Name	Remarks
JG002B	APJG002B00	Adapter	VSR Torque, Brake Torque (S Reel/T Reel Ass'y)
JG002E	APJG002E00	Dial Torque Gauge (10~90gf•cm)	Brake Torque (T Reel Ass'y)
JG002F	APJG002F00	Dial Torque Gauge (60~600gf•cm)	VSR Torque, Brake Torque (S Reel)
JG022	APJG022000	Master Plane	Reel Disk Height Adjustment
JG024A	APJG024A00	Reel Disk Height Adjustment Jig	Reel Disk Height Adjustment
JG153	APJG153000	X Value Adjustment Screwdriver	X Value Adjustment
JG154	APJG154000	Cable	Used to connect the test point of SERVICE and GROUND
JG180	APJG180000	AV Jack Jig	PG Shifter Adjustment

PREPARATION FOR SERVICING

How to use the Servicing Fixture

1. Remove the Syscon PCB from the set.
Be sure to place the parts on a paper so that they have no short-circuit each other.
2. Short circuit between **TP1001** and **Ground** with the cable JG154.
(The BOT, EOT, and the Reel Sensor do not work and the deck can be operated without a cassette tape.)
3. In case of using a cassette tape, press the STOP/EJECT button to insert or eject a cassette tape.
Turn on the power and re-check the cable before checking the trouble points.

MECHANICAL ADJUSTMENTS

1. CONFIRMATION AND ADJUSTMENT

Read the following NOTES before starting work.

- Place an object which weighs between 450g~500g on the Cassette Tape to keep it steady when you want to make the tape run without the Cassette Holder. (Do not place an object which weighs over 500g.)

1-1: CONFIRMATION AND ADJUSTMENT OF REEL DISK HEIGHT

- Turn on the power and set to the STOP mode.
- Set the master plane (**JG022**) and reel disk height adjustment jig (**JG024A**) on the mechanism framework, taking care not to scratch the drum, as shown in **Fig. 1-1-A**.
- While turning the reel and confirm the following points. Check if the surface "A" of reel disk is lower than the surface "B" of reel disk height adjustment jig (**JG024A**) and is higher than the surface "C". If it is not passed, place the height adjustment washers and adjust to $10(+2, -0)$ mm.
- Adjust the other reel in the same way.

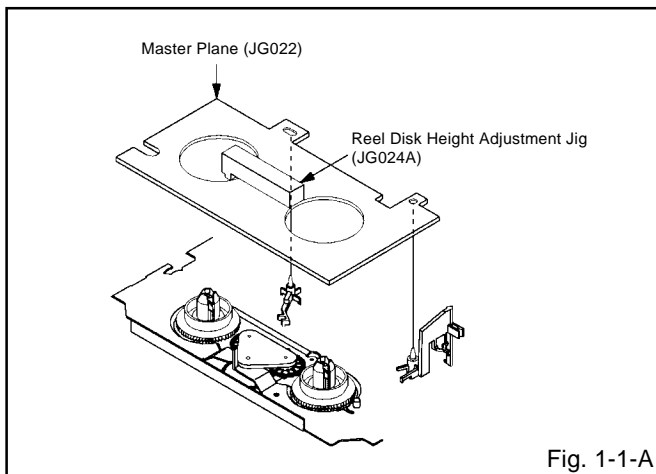


Fig. 1-1-A

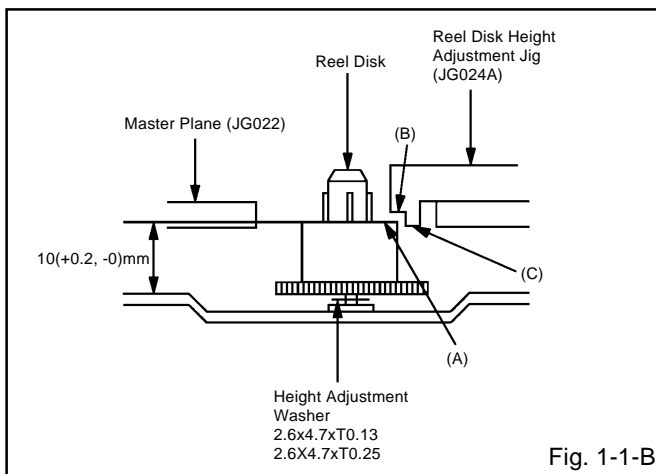


Fig. 1-1-B

1-2: CONFIRMATION AND ADJUSTMENT OF TENSION POST POSITION

- Set to the PLAY mode.
- Adjust the adjusting section for the Tension Arm position so that the Tension Arm top is within the standard line of Main Chassis.
- While turning the S Reel clockwise, confirm that the edge of the Tension Arm is located in the position described above.

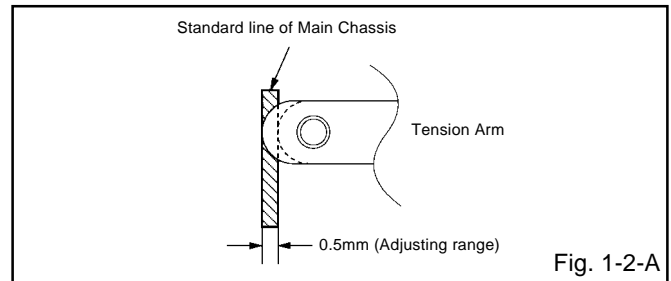


Fig. 1-2-A

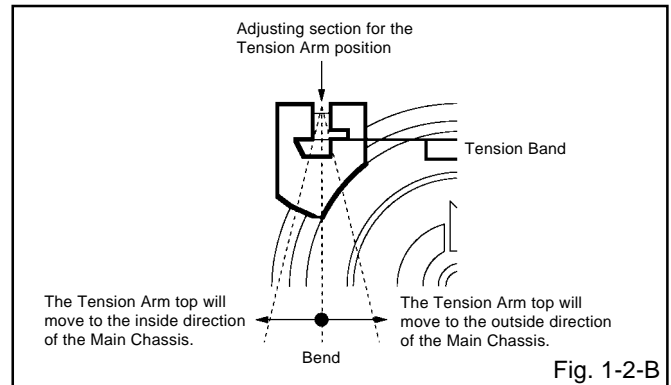


Fig. 1-2-B

1-3: CONFIRMATION OF PLAYBACK TORQUE AND BACK TENSION TORQUE DURING PLAYBACK

- Load a video tape (T-120) recorded in standard speed mode. Set the unit to the PLAY mode.
- Install the tentelometer as shown in **Fig. 1-3**. Confirm that the meter indicates 20 ± 2 gf in the beginning of playback.

• USING A CASSETTE TYPE TORQUE TAPE (KT-300NR)

- After confirmation and adjustment of Tension Post position (**Refer to item 1-2**), load the cassette type torque tape (**KT-300NR**) and set to the PLAY mode.
- Confirm that the right meter of the torque tape indicates $50 \sim 90$ gf•cm during playback in SP mode.
- Confirm that the left meter of the torque tape indicates $25 \sim 40$ gf•cm during playback in SP mode.

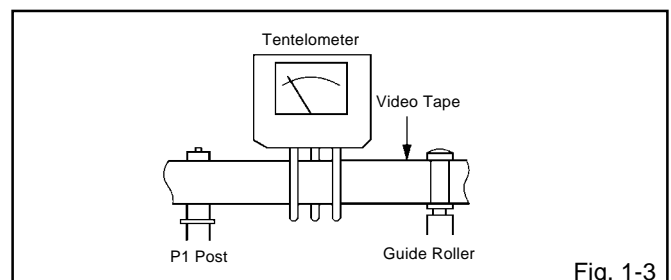


Fig. 1-3

MECHANICAL ADJUSTMENTS

1-4: CONFIRMATION OF VSR TORQUE

1. Install the Torque Gauge (**JG002F**) and Adapter (**JG002B**) on the S Reel. Set to the Picture Search (Rewind) mode. (Refer to Fig.1-4-B)
2. Then, confirm that it indicates 120~180gf•cm.

NOTE

Install the Torque Gauge on the reel disk firmly. Press the REW button to turn the reel disk.

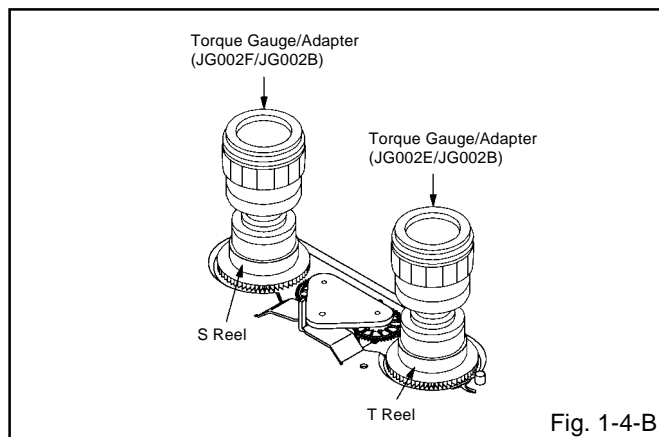
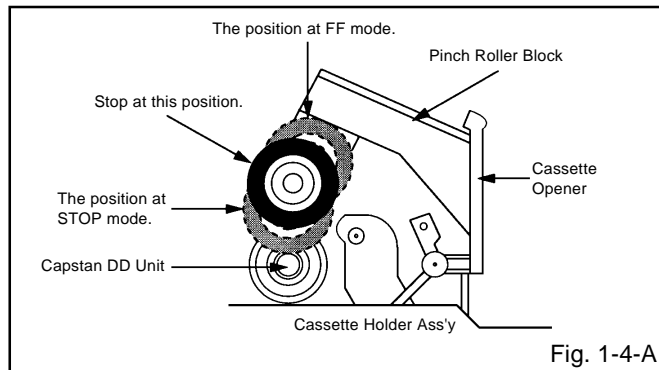
1-5: CONFIRMATION OF REEL BRAKE TORQUE

(S Reel Brake) (Refer to Fig. 1-4-B)

1. Once set to the Fast Forward mode then set to the Stop mode. While, unplug the AC cord when the Pinch Roller Block is on the position of Fig. 1-4-A.
2. Move the Idler Ass'y from the S Reel.
3. Install the Torque Gauge (**JG002F**) and Adapter (**JG002B**) on the S Reel. Turn the Torque Gauge (**JG002F**) clockwise.
4. Then, confirm that it indicates 60~100gf•cm.

(T Reel Brake) (Refer to Fig. 1-4-B)

1. Once set to the Fast Forward mode then set to the Stop mode. While, unplug the AC cord when the Pinch Roller Block is on the position of Fig. 1-4-A.
2. Move the Idler Ass'y from the T Reel.
3. Install the Torque Gauge (**JG002E**) and Adapter (**JG002B**) on the T reel. Turn the Torque Gauge (**JG002E**) counterclockwise.
4. Then, confirm that it indicates 30~50gf•cm.



NOTE

If the torque is out of the range, replace the following parts.

Check item	Replacement Part
1-4	Idler Ass'y/Clutch Ass'y
1-5	S Reel side: S Reel/Tension Band/Tension Connect/Tension Arm Ass'y T Reel side: T Reel/T Brake Band//T Brake Spring/T Brake Arm

2. CONFIRMATION AND ADJUSTMENT OF TAPE RUNNING MECHANISM

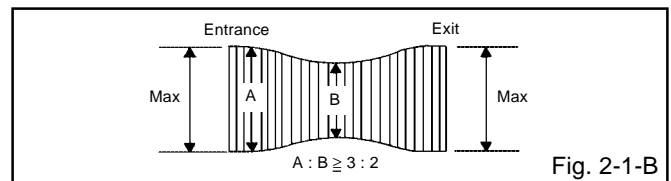
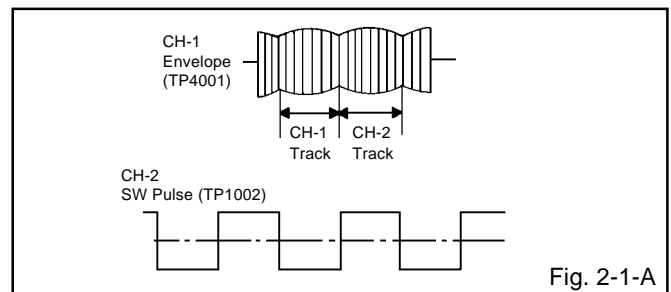
Tape Running Mechanism is adjusted precisely at the factory. Adjustment is not necessary as usual. When you replace the parts of the tape running mechanism because of long term usage or failure, the confirmation and adjustment are necessary.

2-1: GUIDE ROLLER

1. Playback the VHS Alignment Tape.
2. Connect CH-1 of the oscilloscope to **TP4001 (Envelope)** and CH-2 to **TP1002 (SW Pulse)**.
3. Press both VOL. DOWN button on the set and the Channel button (**5**) on the remote control simultaneously.
4. Trigger with SW Pulse and observe the envelope. (Refer to Fig. 2-1-A)
5. When observing the envelope, adjust the Taper Nut Driver slightly until the envelope will be flat.
Even if you press the Tracking Button, adjust so that flatness is not moved so much.
6. Adjust so that the A : B ratio is better than 3 : 2 as shown in Fig. 2-1-B, even if you press the Tracking Button to move the envelope (The envelope waveform will begin to decrease when you press the Tracking Button).
7. Adjust the PG shifter during playback.
(Refer to the **ELECTRICAL ADJUSTMENTS**)

NOTE

After adjustment, confirm and adjust A/C head. (Refer to item 2-2)

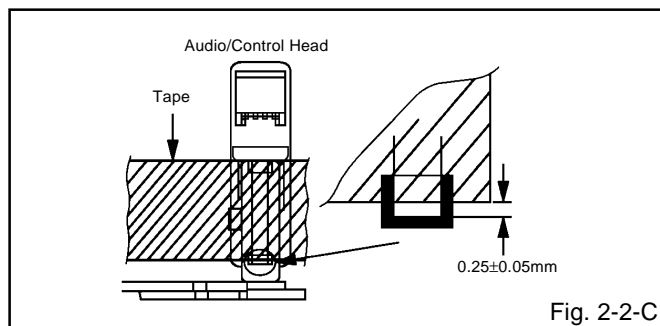
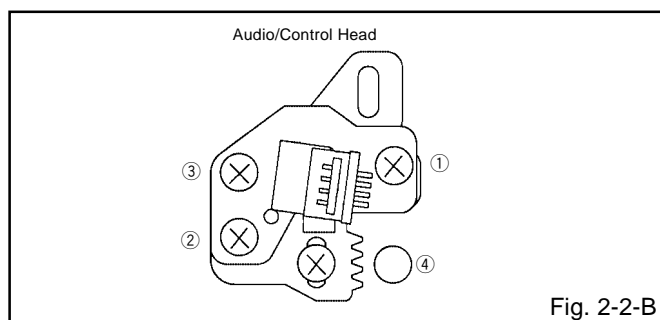
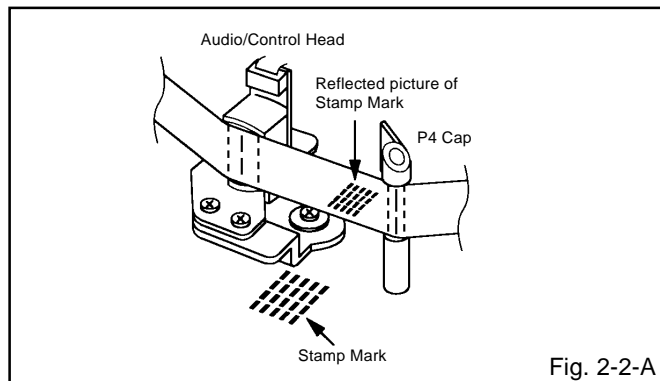


MECHANICAL ADJUSTMENTS

2-2: CONFIRMATION AND ADJUSTMENT OF AUDIO/CONTROL HEAD

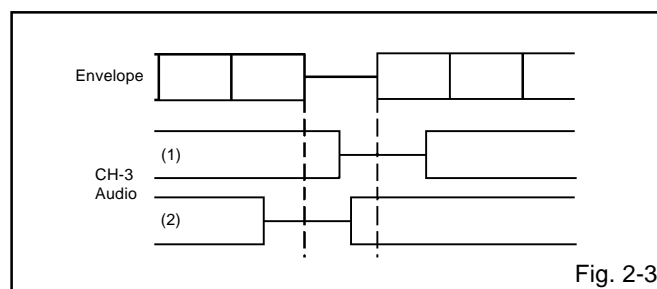
When the Tape Running Mechanism does not work well, adjust the following items.

1. Playback the VHS Alignment Tape.
2. Confirm that the reflected picture of stamp mark is appeared on the tape prior to P4 Cap as shown in **Fig. 2-2-A**.
 - a) When the reflected picture is distorted, turn the screw ① clockwise until the distortion is disappeared.
 - b) When the reflected picture is not distorted, turn the screw ① counterclockwise until little distortion is appeared, then adjust the a).
3. Turn the screw ② to set the audio level to maximum.
4. Confirm that the bottom of the Audio/ Control Head and the bottom of the tape is shown in **Fig. 2-2-C**.
 - c) When the height is not correct, turn the screw ③ to adjust the height. Then, adjust the 1~3 again.



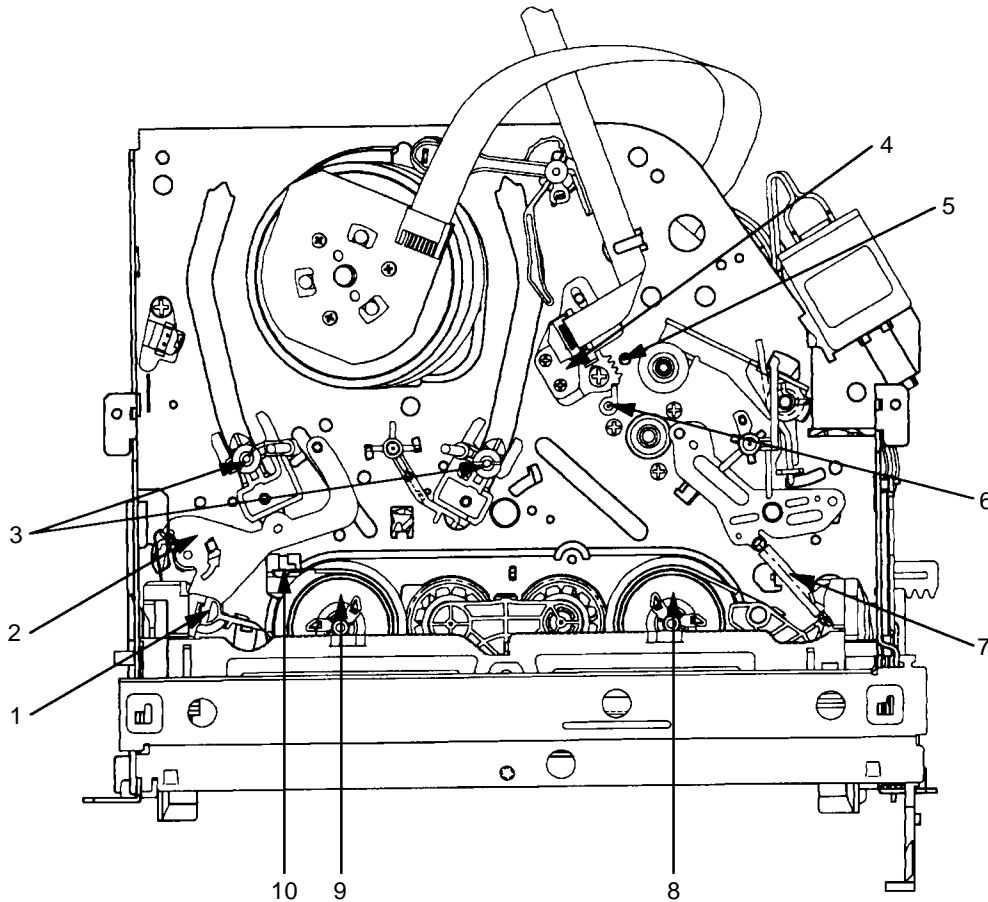
2-3: TAPE RUNNING ADJUSTMENT (X VALUE ADJUSTMENT)

1. Confirm and adjust the height of the Reel Disk. (**Refer to item 1-1**)
2. Confirm and adjust the position of the Tension Post. (**Refer to item 1-2**)
3. Adjust the Guide Roller. (**Refer to item 2-1**)
4. Confirm and adjust the Audio/Control Head. (**Refer to item 2-2**)
5. Connect the connector of AV Jack Jig (**JG180**) to **CP1003**.
6. Connect CH-1 of the oscilloscope to **TP1002**, CH-2 to **TP4001** and CH-3 to **Hot side of JG180 Audio out Jack**.
7. Playback the VHS Alignment Tape.
8. Press both VOL. DOWN button on the set and the Channel button (5) on the remote control simultaneously.
9. Set the X Value adjustment driver (**JG153**) to the ④ of **Fig. 2-2-B**. Adjust X value so that the envelope waveform output becomes maximum. Check if the relation between Audio and Envelope waveform becomes (1) or (2) of **Fig. 2-3**.



MECHANICAL ADJUSTMENTS

3. MECHANISM ADJUSTMENT PARTS LOCATION GUIDE



- | | |
|-----------------------------------|----------------------------------------------------|
| 1. Tension Connect | 6. P4 Post |
| 2. Tension Arm | 7. T Brake Spring |
| 3. Guide Roller | 8. T Reel |
| 4. Audio/Control Head | 9. S Reel |
| 5. X value adjustment driver hole | 10. Adjusting section for the Tension Arm position |

ELECTRICAL ADJUSTMENTS

1. BEFORE MAKING ELECTRICAL ADJUSTMENTS

Read and perform these adjustments when repairing the circuits or replacing electrical parts or PCB assemblies.

CAUTION

- Use an isolation transformer when performing any service on this chassis.
- Before removing the anode cap, discharge electricity because it contains high voltage.
- When removing a PCB or related component, after unfastening or changing a wire, be sure to put the wire back in its original position.
- When you exchange IC and Transistor for a heat sink, apply the silicon grease on the contact section of the heat sink. Before applying new silicon grease, remove all the old silicon grease. (Old grease may cause damages to the IC and Transistor.)

Prepare the following measurement tools for electrical adjustments.

1. Oscilloscope
2. Digital Voltmeter

On-Screen Display Adjustment

1. Unplug the AC plug for more than 5 seconds to set the clock to the non-setting state. Then, set the volume level to minimum.
2. Press the VOL. DOWN button on the set and the Channel button (9) on the remote control simultaneously to appear the adjustment mode on the screen as shown in **Fig. 1-1**.

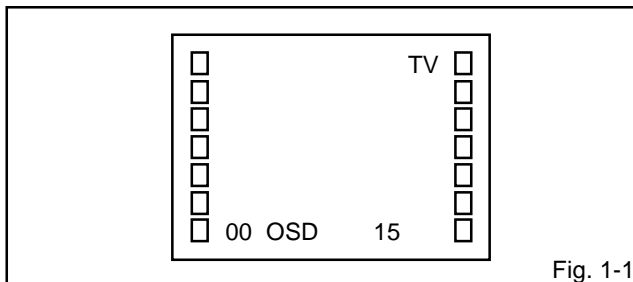


Fig. 1-1

3. Use the Channel UP/DOWN button or Channel button (0-9) on the remote control to select the options shown in **Fig. 1-2**.
4. Press the MENU button on the remote control to end the adjustments.

NO.	FUNCTION	NO.	FUNCTION
00	OSD H	16	CONT.CENT
01	CUT OFF	17	CONT.MAX
02	RF AGC	18	CONT.MIN
03	V.VCO	19	COL.CENT
04	H.VCO	20	COL.MAX
05	H.PHAS	21	COL.MIN
06	V.SIZE	22	TINT
07	V.SFT	23	SHARP
08	R.DRV	24	FM.LVL
09	B.DRV	25	LVL
10	R CUT OFF	26	SEP1
11	G CUT OFF	27	SEP2
12	B CUT OFF	28	T.MONO
13	BRI.CENT	29	T.STE
14	BRI.MAX		
15	BRI.MIN		

Fig. 1-2

2. BASIC ADJUSTMENTS (VCR SECTION)

2-1: PG SHIFTER

1. Connect the connector of AV Jack Jig (**JG180**) to **CP1003**.
2. Connect CH-1 on the oscilloscope to **TP1002** and CH-2 to **Hot side of JG180 Video out Jack**.
3. Playback the alignment tape.
4. Press both VOL.DOWN button on the set and the Channel button (5) on the remote control simultaneously to set tracking to center.
5. Press the VOL. DOWN button on the set and the channel button (3) on the remote control simultaneously until the indicator REC disappears. If the indicator REC disappears, adjustment is completed.

(If the above adjustments doesn't work well:)

6. Press the VOL. DOWN button on the set and the channel button (3) on the remote control simultaneously until the indicator REC disappears.
7. When the REC indicator is blinking, press both VOL. DOWN button on the set and the channel button (4) on the remote control simultaneously and adjust the
8. Tracking +/- button until the arising to the down of Head Switching Pulse becomes $6.5 \pm 0.5H$.
(Refer to Fig. 2-1-A, B)
9. Press the Tracking Auto button.

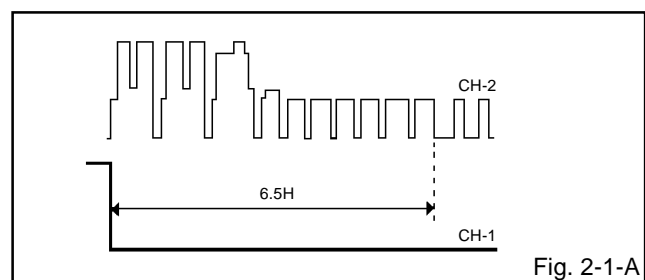
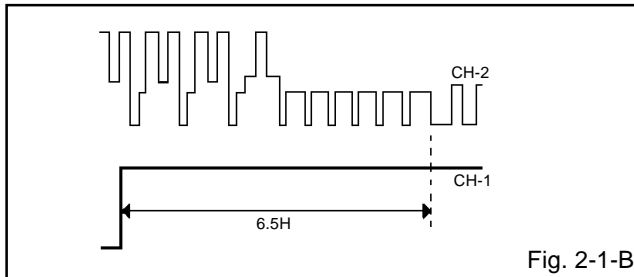


Fig. 2-1-A

ELECTRICAL ADJUSTMENTS



2-2: VCO FREERUN

1. Receive the VHF HIGH (63dB).
2. Place the set with Aging Test for more than 10 minutes.
3. Connect the digital voltmeter between the **pin 5 of CP351** and the **pin 1 (GND) of CP351**.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(03)** on the remote control to select "V.VCO".
5. Press the VOL. UP/DOWN button on the remote control until the digital voltmeter is 2.5V.
6. After the 2.5V adjustment, countdown the VIF VCO step No. by 1 step with the VOL. DOWN button.

2-3: RF AGC

1. Receive the VHF HIGH (63 ± 1 dB).
2. Connect the digital voltmeter between the **pin 5 of CP351** and the **pin 1 (GND) of CP351**.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(02)** on the remote control to select "RF AGC".
4. Press the VOL. UP/DOWN button on the remote control until the digital voltmeter is 2.7 ± 0.05 V.

(TV SECTION)

2-4: CONSTANT VOLTAGE

1. Using the remote control, set the brightness and contrast to normal position.
2. Connect the digital voltmeter to **TP601 (R520)**.
3. Set condition is AV MODE without signal.
4. Adjust the **VR502** until the digital voltage is 135 ± 0.5 V.

2-5: CUT OFF

1. Adjust the unit to the following settings.
R CUT OFF=127, G CUT OFF=127, B CUT OFF=127,
SUB BRI.CENT=127, SUB CONT.MAX=100
2. Place the set with Aging Test for more than 15 minutes.
3. Set condition is AV MODE without signal.
4. Using the remote control, set the brightness and contrast to normal position.
5. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(01)** on the remote control to select "CUT OFF".
6. Adjust the **Screen Volume** until a dim raster is obtained.

2-6: WHITE BALANCE

NOTE: Adjust after performing CUT OFF adjustment.

1. Place the set with Aging Test for more than 15 minutes.
2. Receive the color bar pattern.
3. Using the remote control, set the brightness and contrast to normal position.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(10)** on the remote control to select "R CUT OFF".
5. Using the VOL. UP/DOWN button on the remote control, adjust the R CUT OFF.
6. Press the CH. UP/DOWN button on the remote control to select the "R DRIVE", "B DRIVE", "G CUT OFF" or "B CUT OFF".
7. Using the VOL. UP/DOWN button on the remote control, adjust the R DRIVE, B DRIVE, G CUT OFF or B CUT OFF.
8. Perform the above adjustments 6 and 7 until the white color is looked like a white.

2-7: FOCUS

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Turn the Focus Volume fully counterclockwise once.
4. Adjust the **Focus Volume** until picture is distinct.

2-8: HORIZONTAL PHASE

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(05)** on the remote control to select "H PHAS".
4. Press the VOL. UP/DOWN button on the remote control until the SHIFT quantity of the OVER SCAN on right and left becomes minimum.

2-9: VERTICAL SHIFT

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(07)** on the remote control to select "V SFT".
4. Check if the step No. V. SHIFT is "03".
5. Adjust the **VR401** until the horizontal line becomes fit to the notch of the shadow mask.

ELECTRICAL ADJUSTMENTS

2-10: VERTICAL SIZE

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(06)** on the remote control to select "V SIZE".
4. Press the VOL. UP/DOWN button on the remote control until the SHIFT quantity of the OVER SCAN on upside and downside becomes $10 \pm 2\%$.

2-11: SUB BRIGHTNESS

1. Receive the monoscope pattern. (RF Input)
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(13)** on the remote control to select "BRI.CENT".
4. Press the VOL. UP/DOWN button on the remote control until the white 10% is starting to be visible.
5. Receive the monoscope pattern. (Audio Video Input)
6. Press the INPUT SELECT button on the remote control to set to the AV mode. Then perform the above adjustments 2~4.

2-12: SUB CONTRAST MAX

1. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(17)** on the remote control to select "CONT.MAX".
2. Press the VOL. UP/DOWN button on the remote control until the contrast step No. becomes "100".
3. Receive a broadcast and check if the picture is normal.
4. Press the INPUT SELECT button on the remote control to set to the AV mode. Then perform the above adjustments 1~3.

2-13: SUB TINT

1. Receive the color bar pattern. (RF Input)
2. Using the remote control, set the brightness, contrast, color and tint to normal position.
3. Connect the oscilloscope to **TP801**.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(22)** on the remote control to select "TINT".
5. Press the VOL. UP/DOWN button on the remote control until the section "A" becomes a straight line. (**Refer to Fig. 2-2**)
6. Receive the color bar pattern. (Audio Video Input)
7. Press the INPUT SELECT button on the remote control to set to the AV mode. Then perform the above adjustments 2~5.

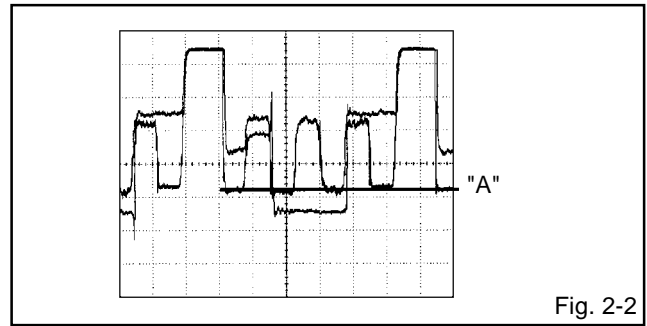


Fig. 2-2

2-14: SUB COLOR

1. Receive the color bar pattern. (RF Input)
2. Using the remote control, set the brightness, contrast, color and tint to normal position.
3. Connect the oscilloscope to **TP803**.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(19)** on the remote control to select "COL.CENT".
5. Adjust the VOLTS RANGE VARIABLE knob of the oscilloscope until the range between white 100% and 0% is set to 4 scales on the screen of the oscilloscope.
6. Press the VOL. UP/DOWN button on the remote control until the red color level is adjusted to $110 \pm 10\%$ of the white level. (**Refer to Fig. 2-3**)
7. Receive the color bar pattern. (Audio Video Input)
8. Press the INPUT SELECT button on the remote control to set to the AV mode. Then perform the above adjustments 2~6.

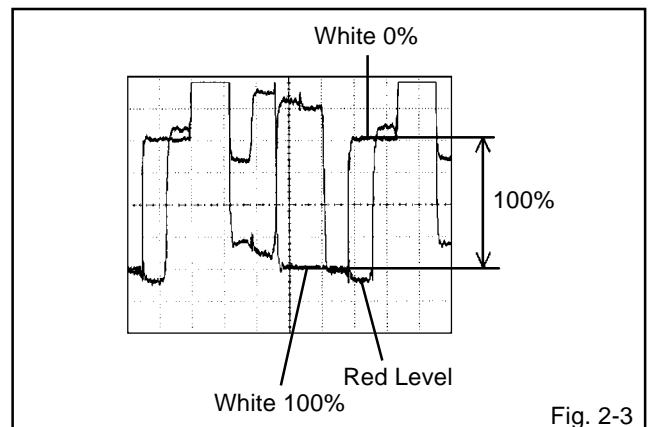
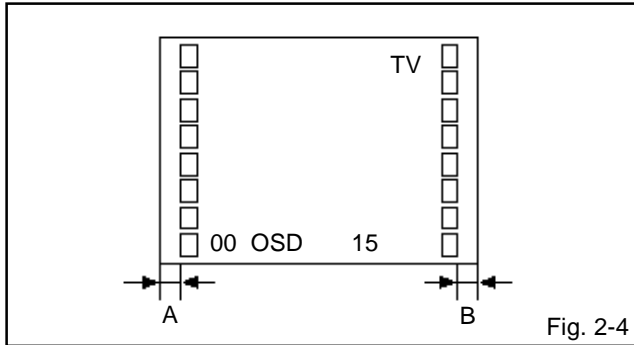


Fig. 2-3

ELECTRICAL ADJUSTMENTS

2-15: OSD HORIZONTAL

1. Activate the adjustment mode display of **Fig. 1-1**.
2. Press the VOL. UP/DOWN button on the remote control until the difference of A and B becomes minimum.
(Refer to **Fig. 2-4**)



2-16: SUB SHARPNESS

1. Activate the adjustment mode display of **Fig. 1-1** and press the channel button (**23**) on the remote control to select "SHARP".
2. Check if the step No. of SHARPNESS is "35".
3. Press the INPUT SELECT button on the remote control to set to the AV mode.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button (**23**) on the remote control to select "SHARP".
5. Check if the step No. of SHARPNESS is "30".

2-17: H VCO

1. Activate the adjustment mode display of **Fig. 1-1** and press the channel button (**04**) on the remote control to select "H VCO".
2. Check if the step No. of H VCO is "04".

ELECTRICAL ADJUSTMENTS

3. PURITY AND CONVERGENCE ADJUSTMENTS

NOTE

1. Turn the unit on and let it warm up for at least 30 minutes before performing the following adjustments.
2. Place the CRT surface facing east or west to reduce the terrestrial magnetism.
3. Turn ON the unit and demagnetize with a Degauss Coil.

3-1: STATIC CONVERGENCE (ROUGH ADJUSTMENT)

1. Tighten the screw for the magnet. Refer to the adjusted CRT for the position. **(Refer to Fig. 3-1)**
If the deflection yoke and magnet are in one body, untighten the screw for the body.
2. Receive the green raster pattern from the color bar generator.
3. Slide the deflection yoke until it touches the funnel side of the CRT.
4. Adjust center of screen to green, with red and blue on the sides, using the pair of purity magnets.
5. Switch the color bar generator from the green raster pattern to the crosshatch pattern.
6. Combine red and blue of the 3 color crosshatch pattern on the center of the screen by adjusting the pair of 4 pole magnets.
7. Combine red/blue (magenta) and green by adjusting the pair of 6 pole magnets.
8. Adjust the crosshatch pattern to change to white by repeating steps 6 and 7.

3-2: PURITY

NOTE

Adjust after performing adjustments in section 3-1.

1. Receive the green raster pattern from color bar generator.
2. Adjust the pair of purity magnets to center the color on the screen.
Adjust the pair of purity magnets so the color at the ends are equally wide.
3. Move the deflection yoke backward (to neck side) slowly, and stop it at the position when the whole screen is green.
4. Confirm red and blue colors.
5. Adjust the slant of the deflection yoke while watching the screen, then tighten the fixing screw.

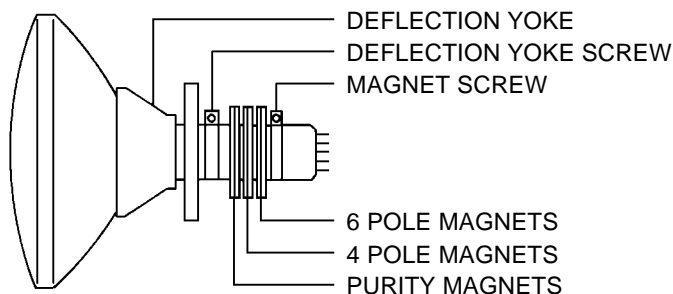


Fig. 3-1

3-3: STATIC CONVERGENCE

NOTE

Adjust after performing adjustments in section 3-2.

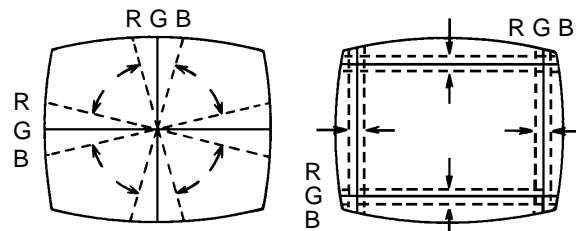
1. Receive the crosshatch pattern from the color bar generator.
2. Combine red and blue of the 3 color crosshatch pattern on the center of the screen by adjusting the pair of 4 pole magnets.
3. Combine red/blue (magenta) and green by adjusting the pair of 6 pole magnets.

3-4: DYNAMIC CONVERGENCE

NOTE

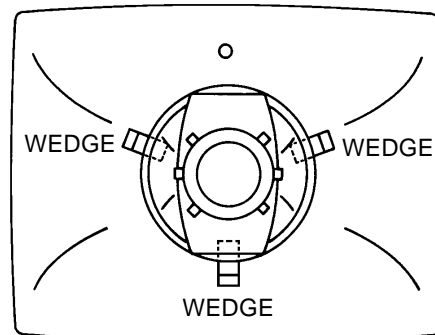
Adjust after performing adjustments in section 3-3.

1. Adjust the differences around the screen by moving the deflection yoke upward/downward and right/left.
(Refer to Fig. 3-2-a)
2. Insert three wedges between the deflection yoke and CRT funnel to fix the deflection yoke.
(Refer to Fig. 3-2-b)



UPWARD/DOWNWARD SLANT RIGHT/LEFT SLANT

Fig. 3-2-a

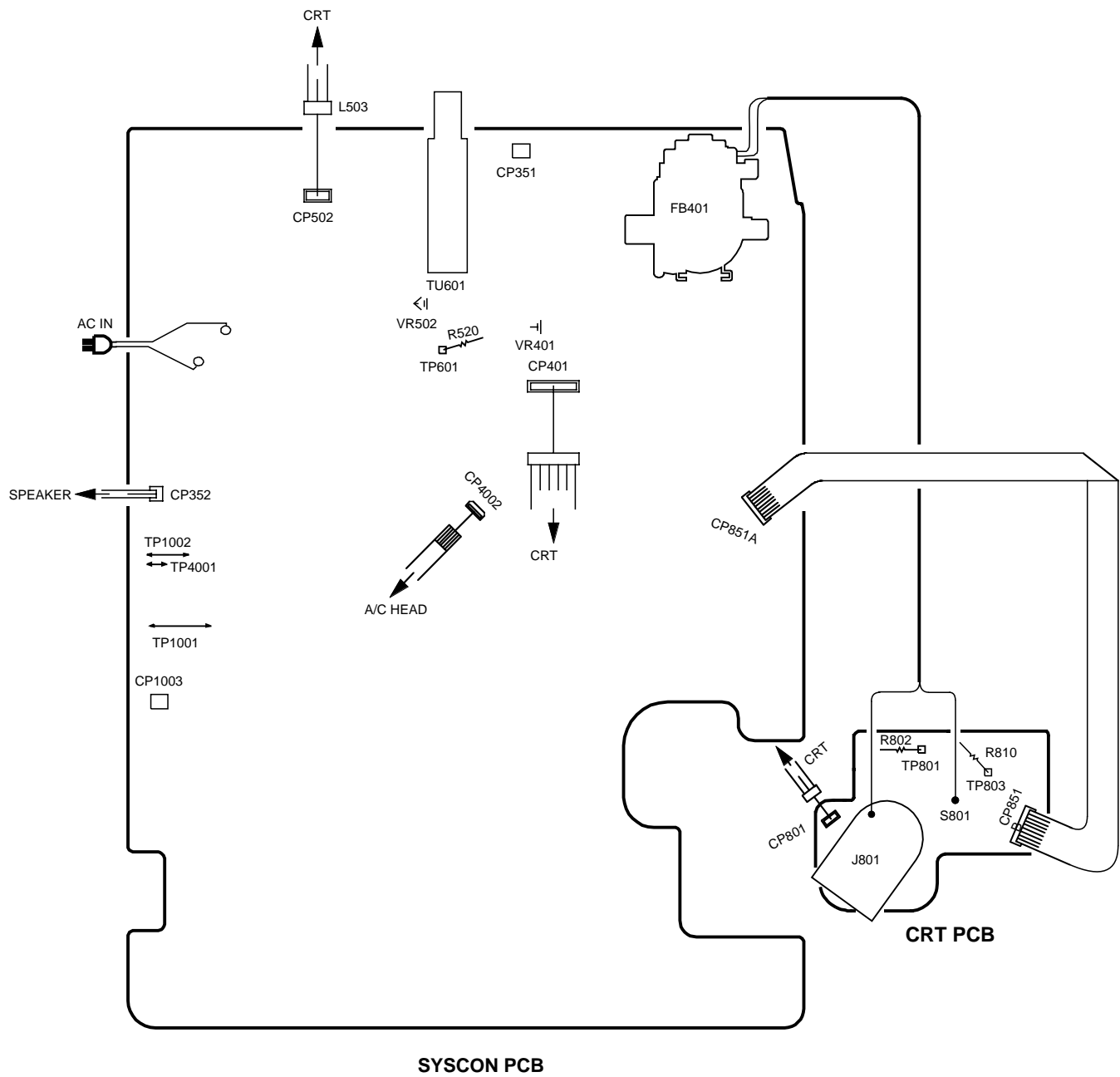


WEDGE POSITION

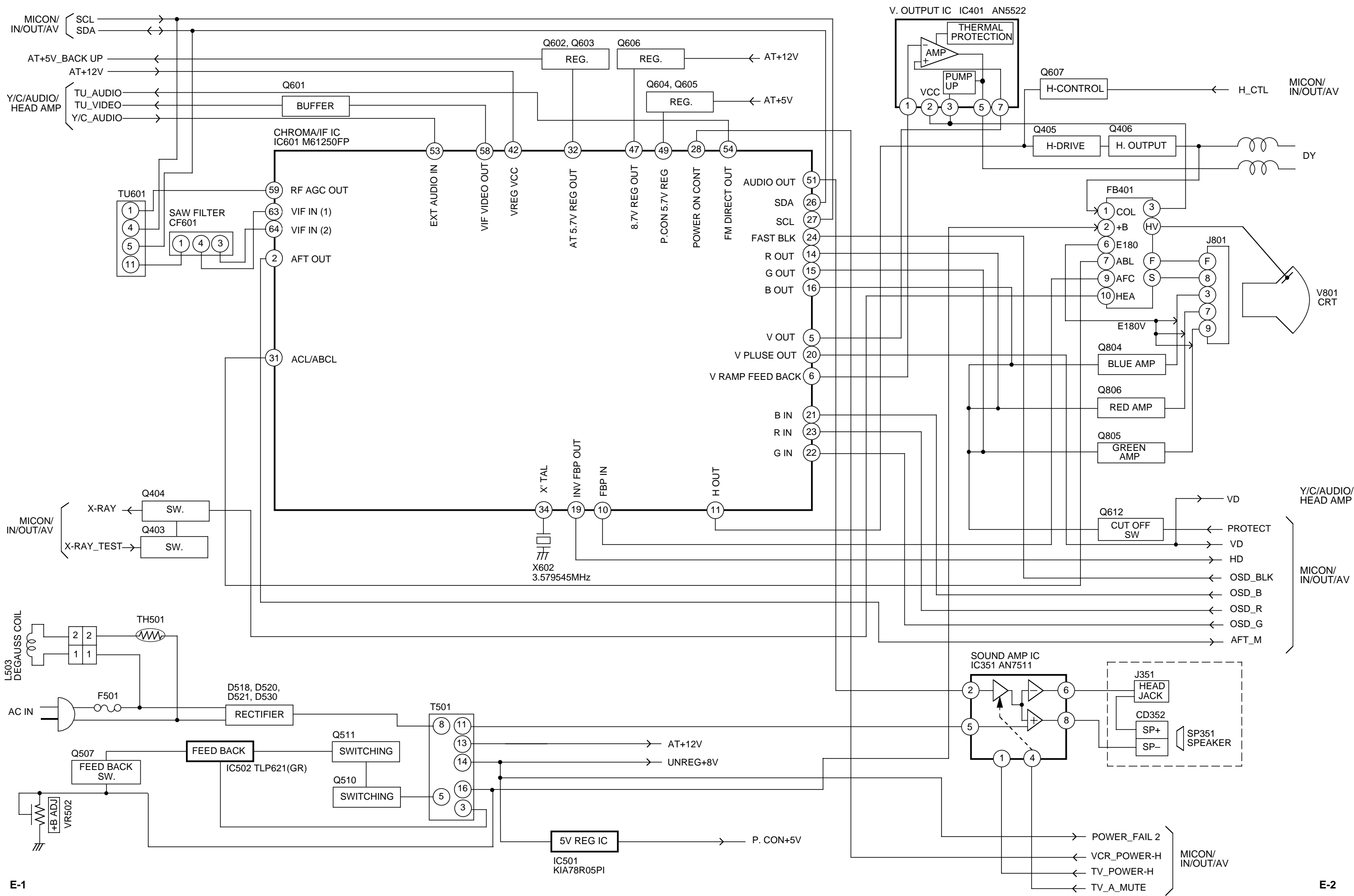
Fig. 3-2-b

ELECTRICAL ADJUSTMENTS

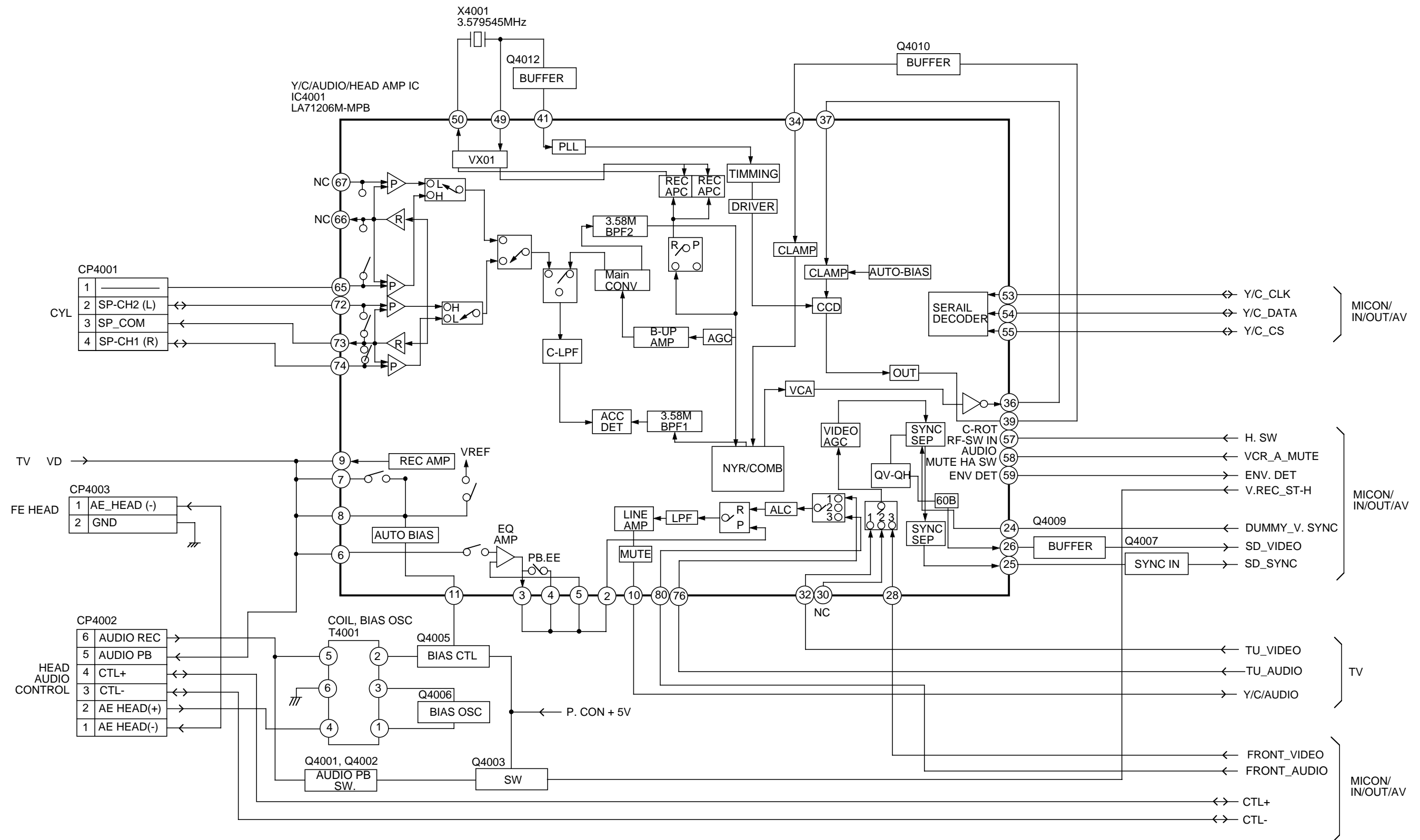
4. ELECTRICAL ADJUSTMENT PARTS LOCATION GUIDE (WIRING CONNECTION)



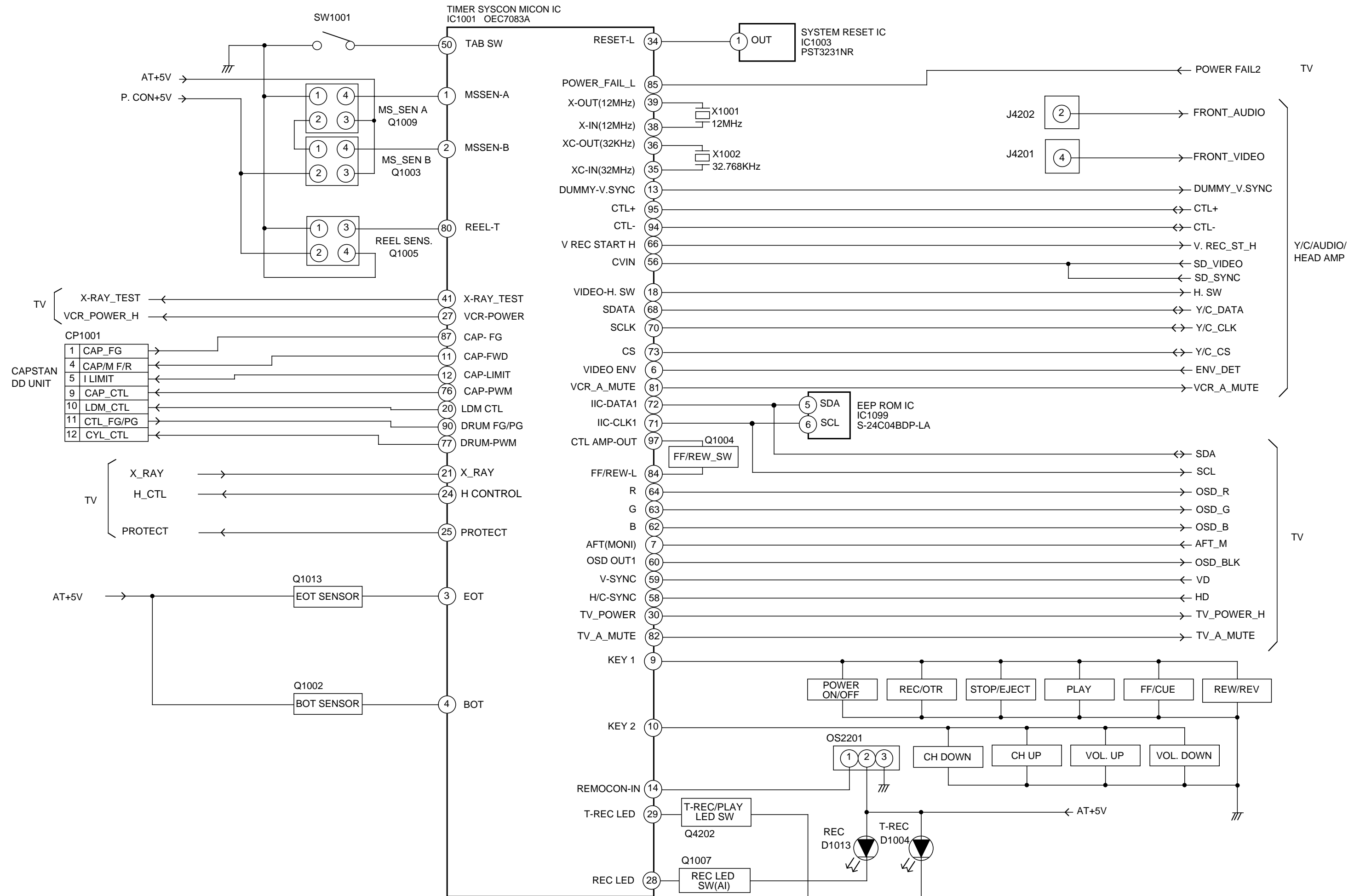
TV BLOCK DIAGRAM



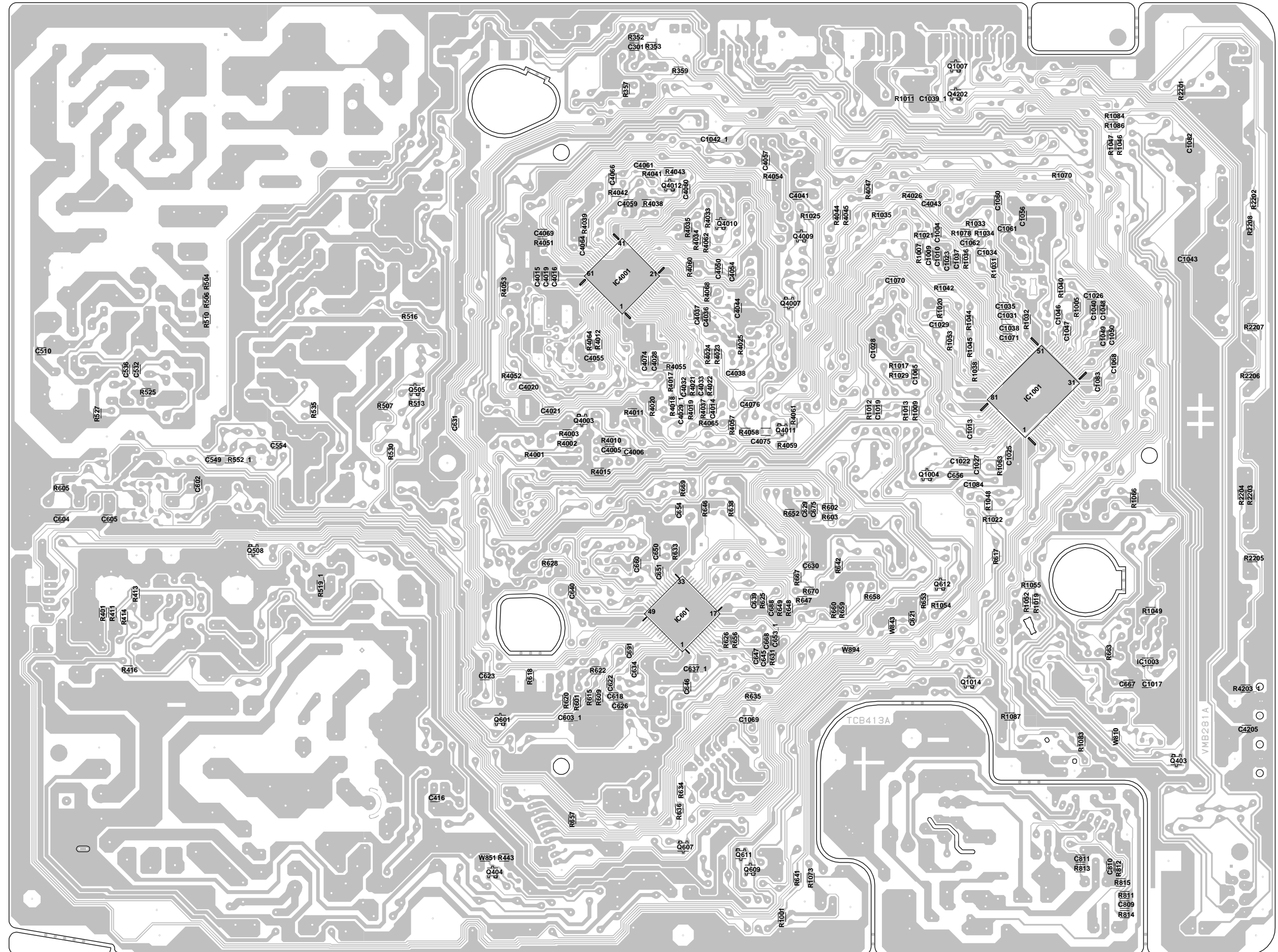
Y/C/AUDIO/HEAD AMP BLOCK DIAGRAM



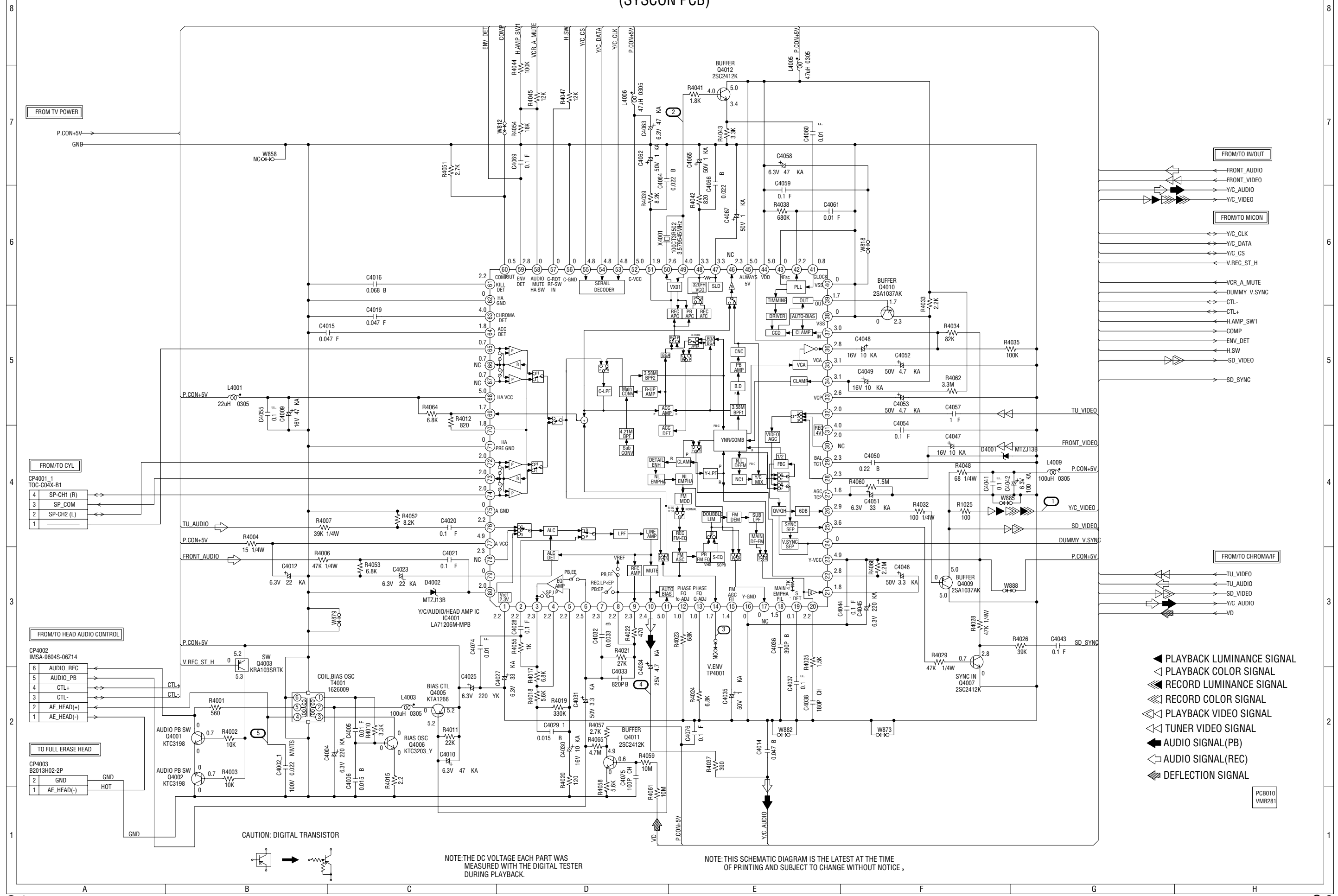
MICON/IN/OUT/AV BLOCK DIAGRAM



PRINTED CIRCUIT BOARDS
SYSCON/CRT (CHIP MOUNTED PARTS)
SOLDER SIDE



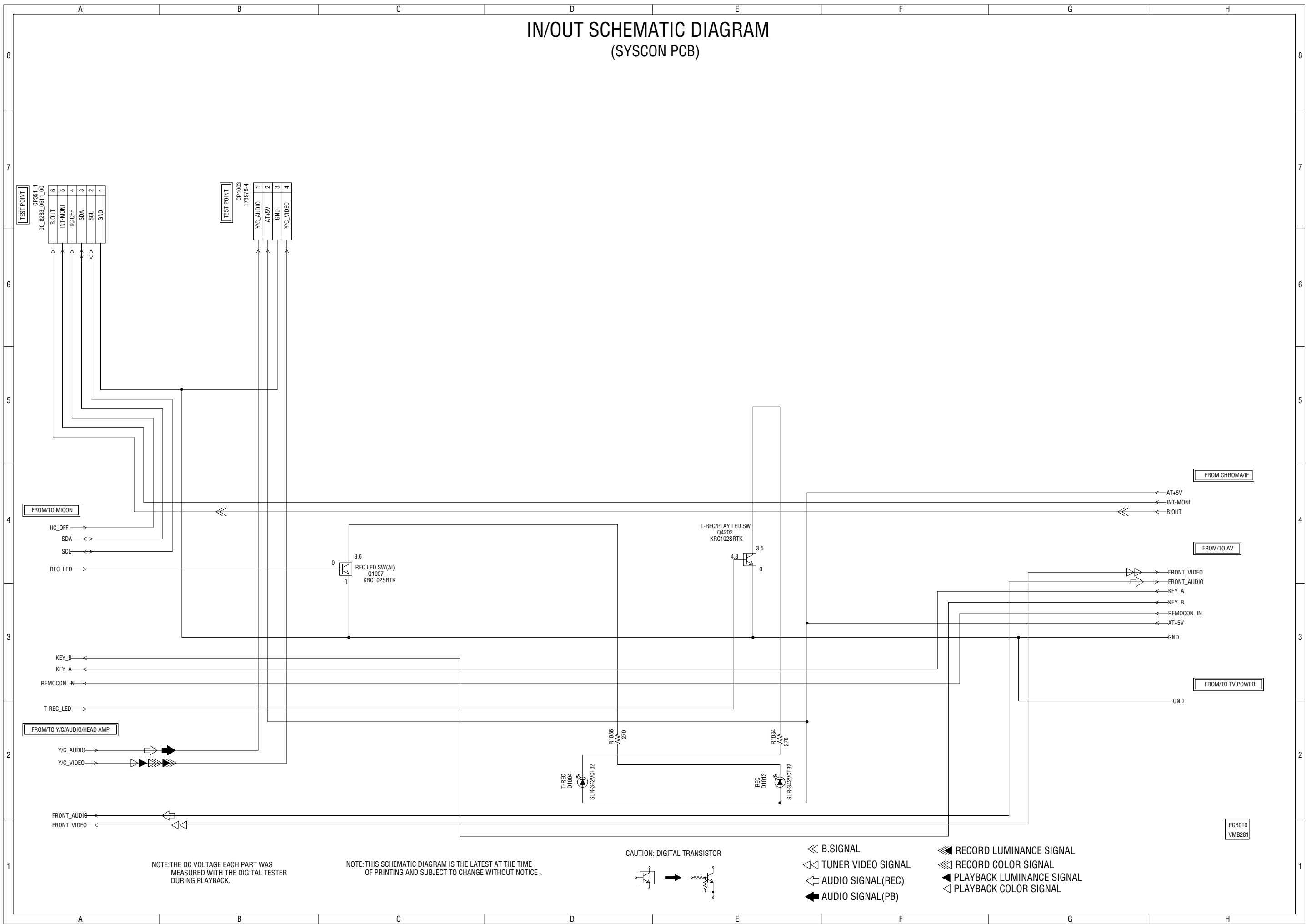
Y/C/AUDIO/HEAD AMP SCHEMATIC DIAGRAM (SYSCON PCB)



The diagram illustrates a circuit transformation. On the left, a transistor is shown in a common-emitter configuration, with its emitter connected to ground. An arrow points to the right, where the same transistor is shown in a common-base configuration, with its base connected to ground. This transformation is a key step in the design of a cascode circuit.

PCB010
VMB281

IN/OUT SCHEMATIC DIAGRAM
(SYSCON PCB)

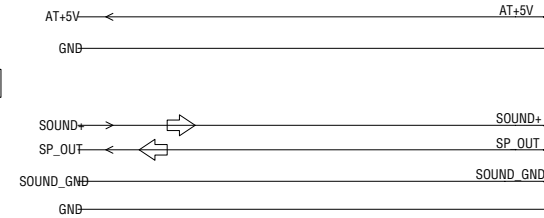


AV SCHEMATIC DIAGRAM
(SYSCON PCB)

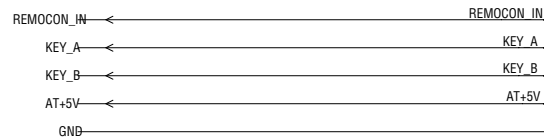
FROM/TO IN/OUT



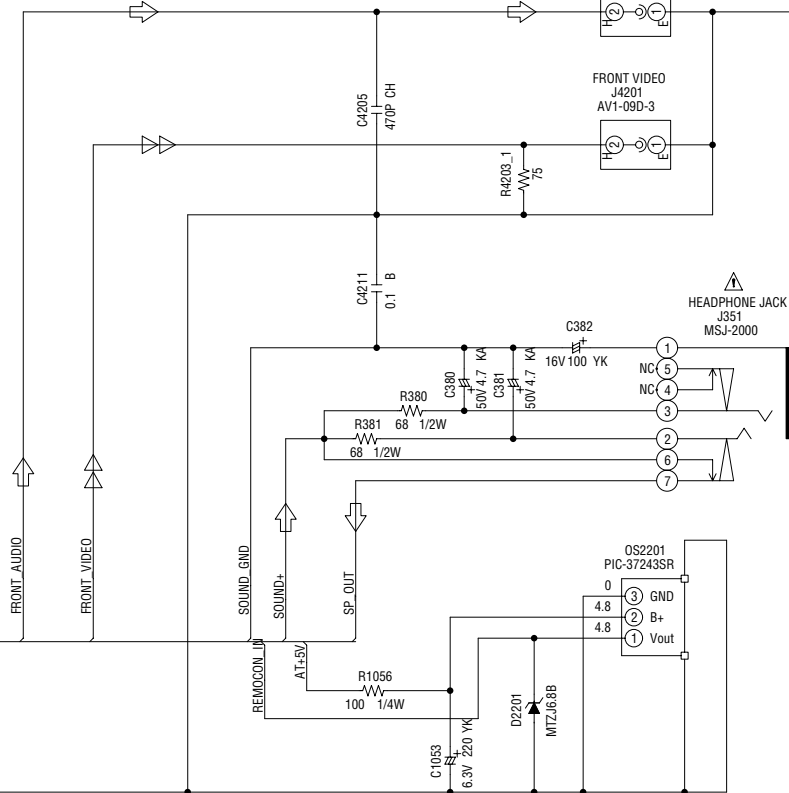
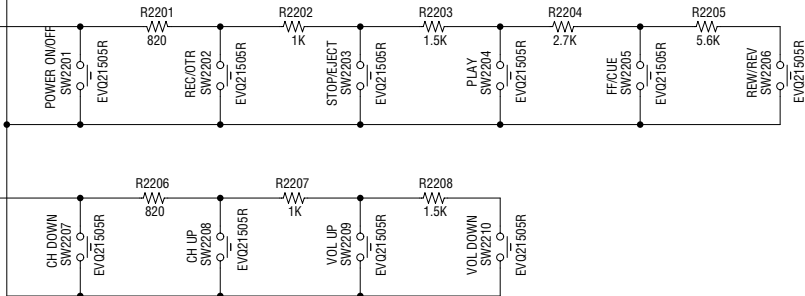
FROM/TO SOND AMP



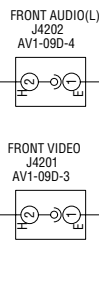
TO MICON




KEY B
KEY A




FROM/TO CHASSIS
CD853
CH012101





PCB010
VMB281

CAUTION: SINCE THESE PARTS MARKED BY  ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY.

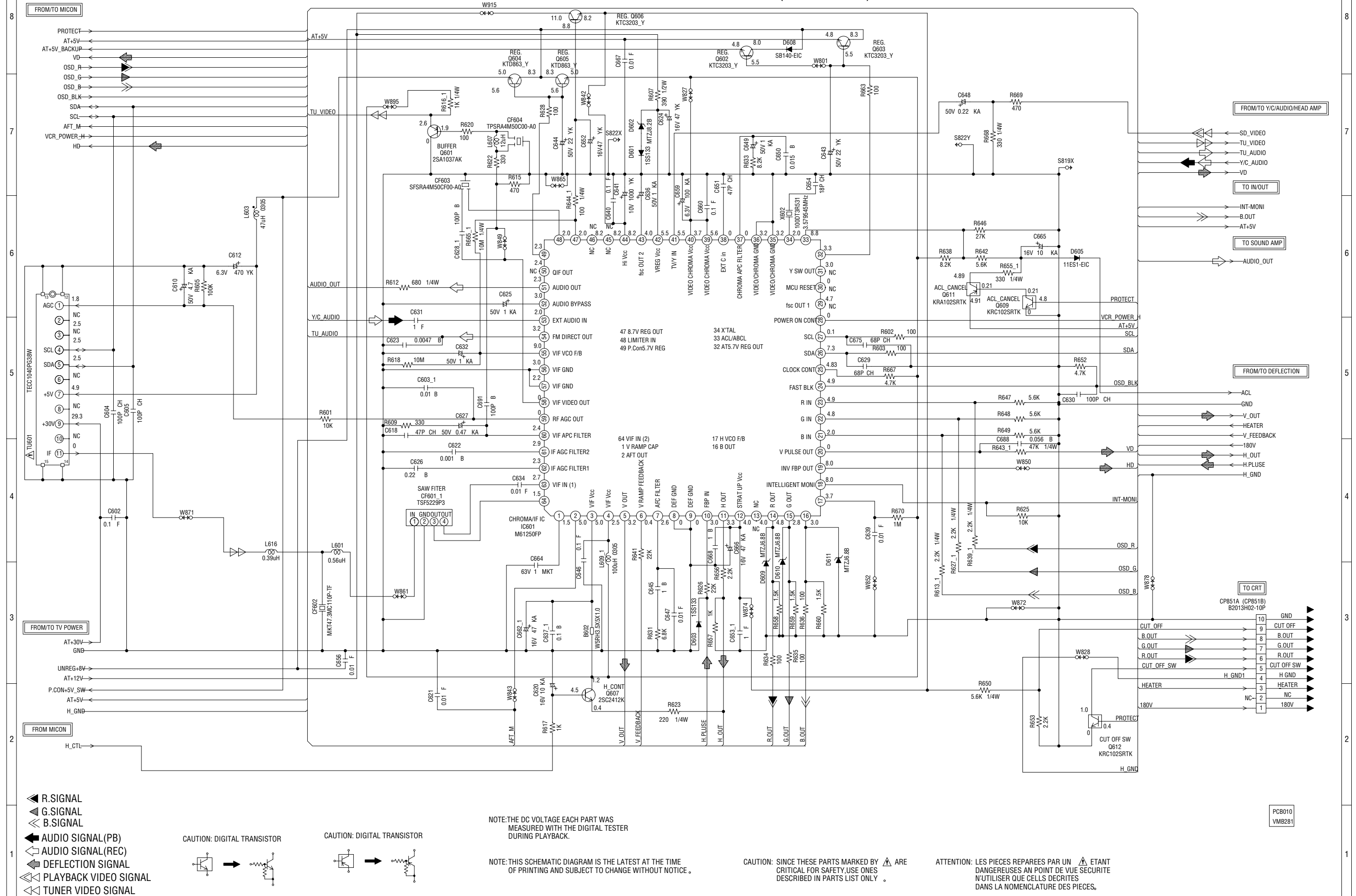
ATTENTION: LES PIECES REPAREES PAR UN  ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES.

NOTE: THE DC VOLTAGE EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

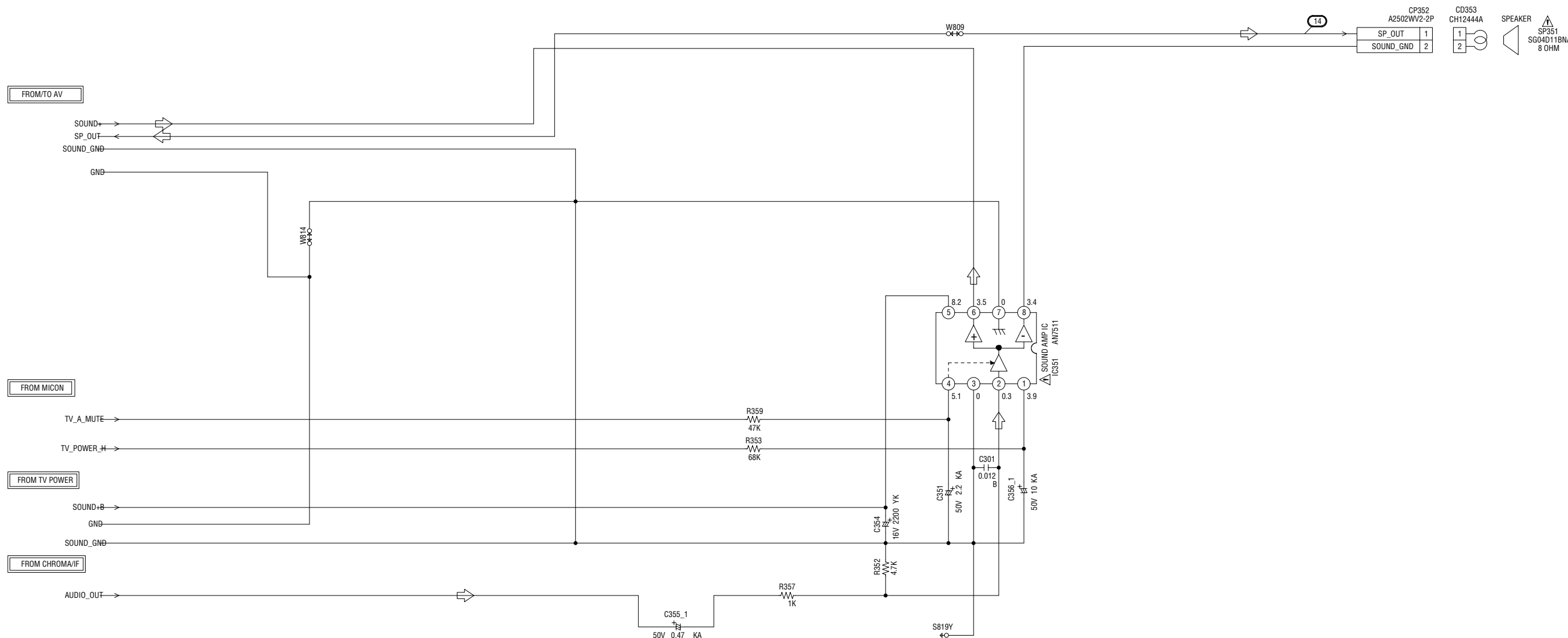
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

 TUNER VIDEO SIGNAL
 AUDIO SIGNAL(REC)

CHROMA/IF SCHEMATIC DIAGRAM (SYSCON PCB)



SOUND AMP SCHEMATIC DIAGRAM
(SYSCON PCB)



NOTE: THE DC VOLTAGE EACH PART WAS
MEASURED WITH THE DIGITAL TESTER
DURING PLAYBACK.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME
OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE .

CAUTION: SINCE THESE PARTS MARKED BY ARE
CRITICAL FOR SAFETY, USE ONES
DESCRIBED IN PARTS LIST ONLY .

ATTENTION: LES PIECES REPARÉES PAR UN ETANT
DANGEREUSES AN POINT DE VUE SECURITE
N'UTILISER QUE CELLS DECRITES
DANS LA NOMENCLATURE DES PIECES.

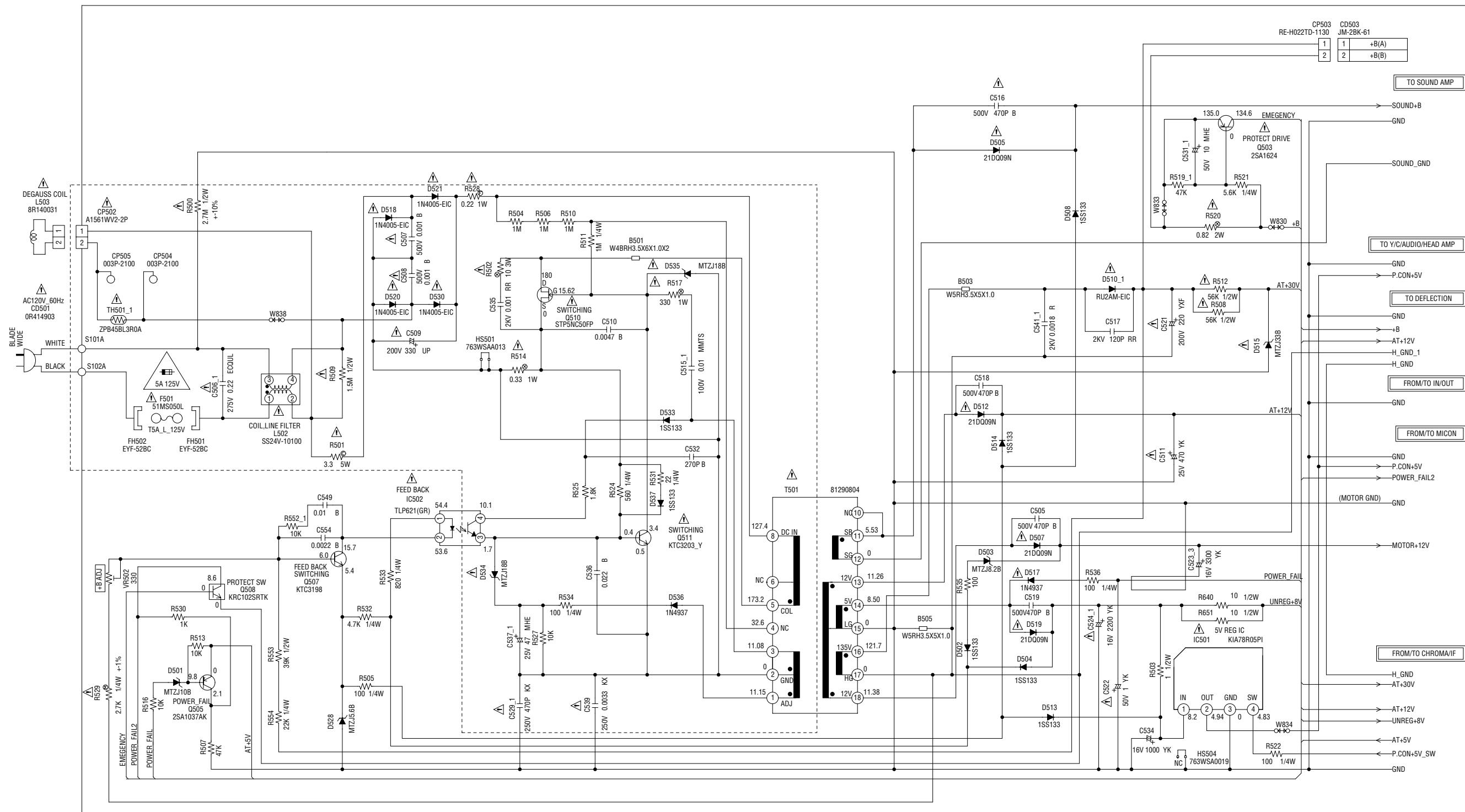
← AUDIO SIGNAL(REC)

TV POWER SCHEMATIC DIAGRAM
(SYSCON PCB)



CAUTION:FOR CONTINUED PROTECTION AGAINST FIRE HAZARD,
REPLACE ONLY WITH THE SAME TYPE FUSE

ATTENTION:POUR UNE PROTECTION CONTINUE LES RISQUES D'INCEIE
N'UTOLISER QUE DES FUSIBLE DE MEME TYPE



CP503	CD503
RE-H022TD-1130	JM-2BK-61
1	1
2	2
	+B(A)
	+B(B)

TO SOUND AMP

SOUND+B

GND

SOUND_GND

TO Y/C/AUDIO/HEAD AMP

GND

P.CON+5V

TO DEFLECTION

GND

+B

AT+12V

H_GND_1

H_GND

FROM/TO IN/OUT

GND

FROM/TO MICON

GND

P.CON+5V

POWER_FAIL2

(MOTOR GND)

GND

MOTOR+12V

POWER FAIL

UNREG+8V

FROM/TO CHROMA/IF

H_GND

AT+30V

AT+12V

UNREG+8V

AT+5V

P.CON+5V_SW

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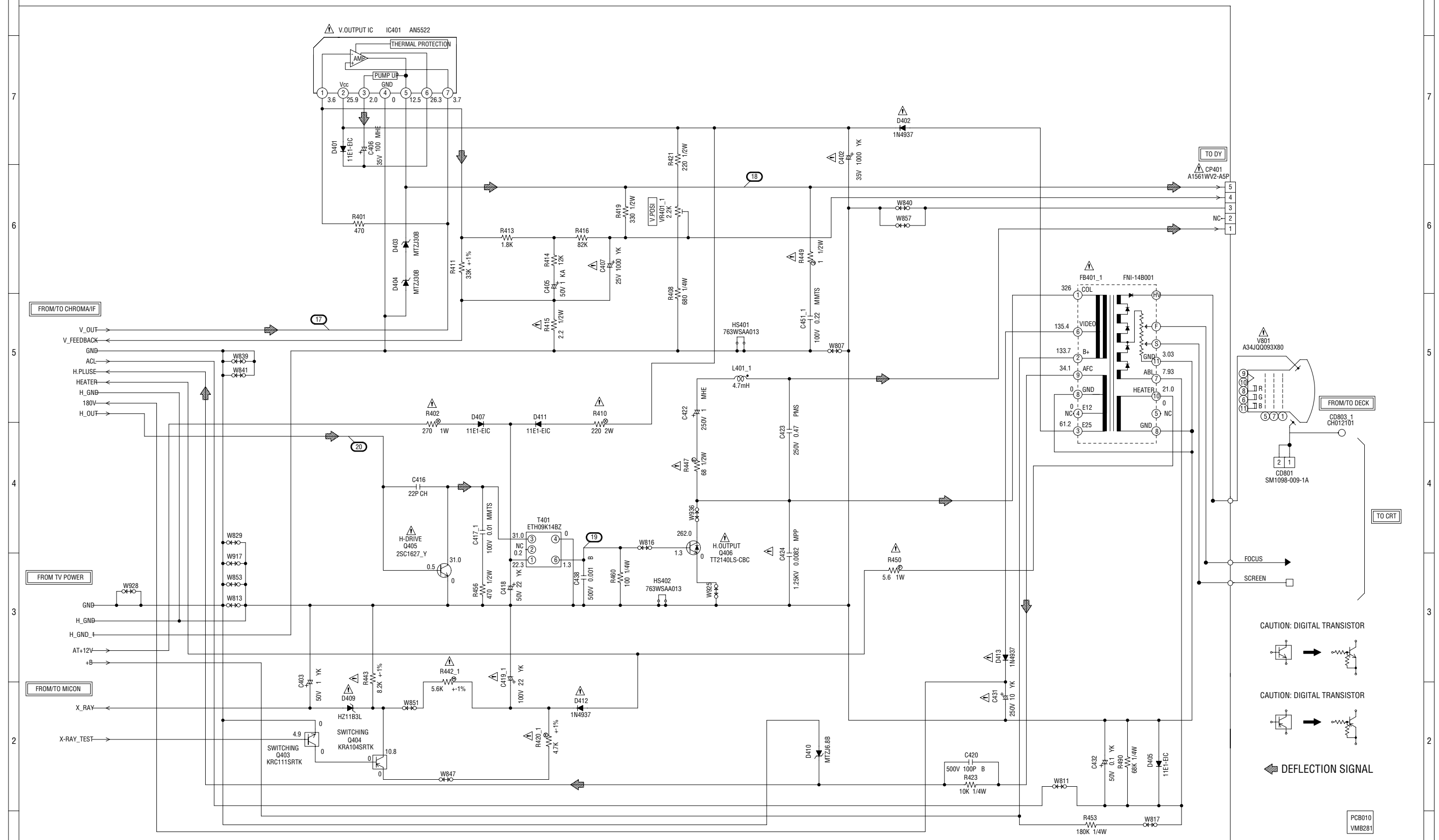
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DEFLECTION SCHEMATIC DIAGRAM (SYSCON PCB)



NOTE:THE DC VOLTAGE AT EACH PART WAS MEASURED
WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST
WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

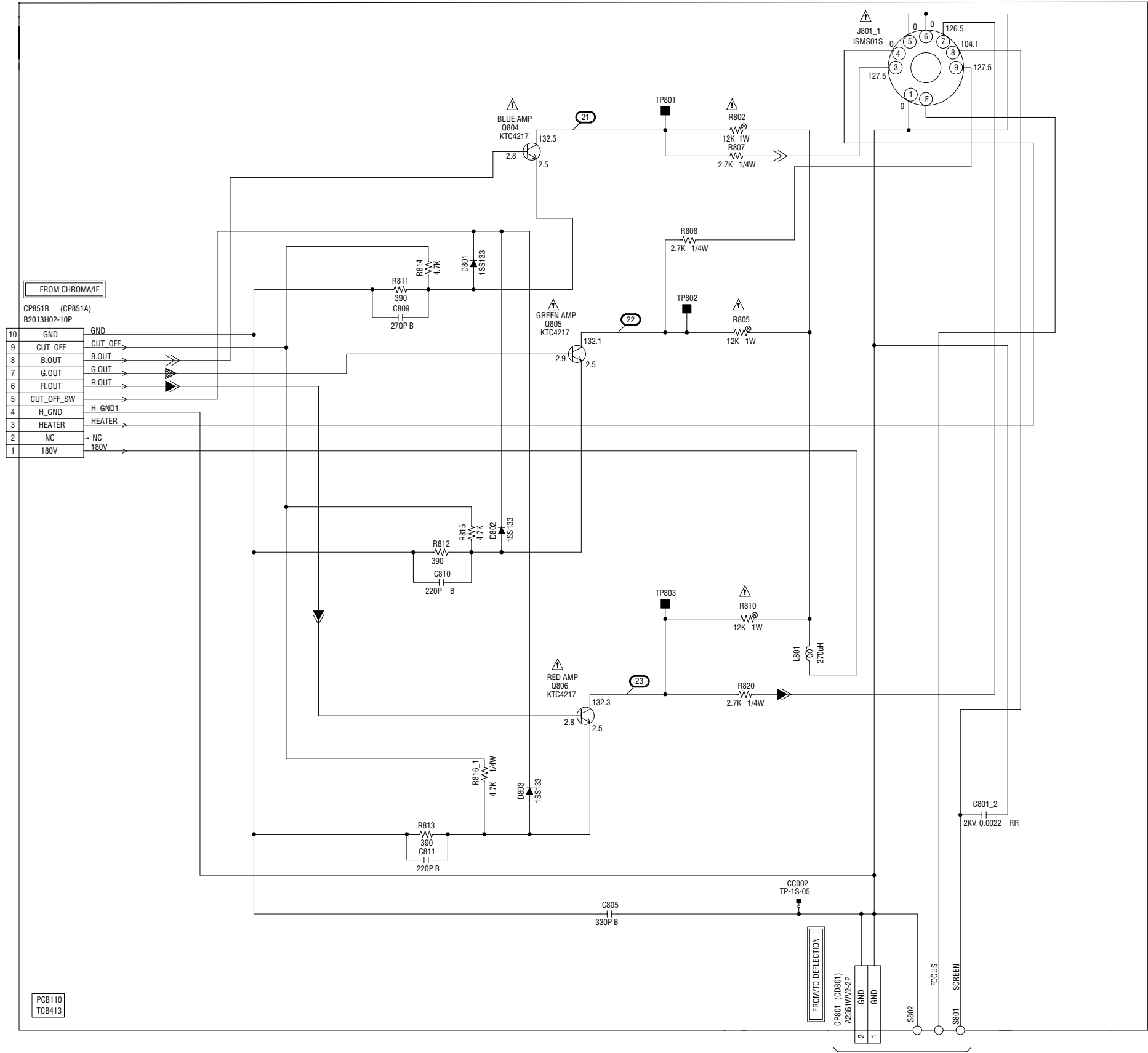
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

CAUTION: SINCE THESE PARTS MARKED BY ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY .

ATTENTION: LES PIÈCES RÉPARÉES PAR UN  ÉTANT DANGEREUSES AU POINT DE VUE SÉCURITÉ N'UTILISER QUE CELLES DÉCRITES DANS LA NOMENCLATURE DES PIÈCES.

NOTE: THE RESISTOR MARKED F IS FUSE RESISTOR.
THE ALUMI ELECTROLYTIC CAPACITOR MARKED NP
IS NON POLAR ONE.

CRT SCHEMATIC DIAGRAM
(CRT PCB)





FROM CHROMA/IF	
CP851B (CP851A)	
B2013H02-10P	
10	GND
9	CUT_OFF
8	B.OUT
7	G.OUT
6	R.OUT
5	CUT_OFF_SW
4	H_GND1
3	HEATER
2	NC
1	180V

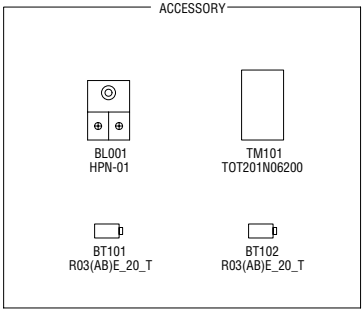
PCB110
TCB413

NOTE:THE DC VOLTAGE AT EACH PART WAS MEASURED
WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST
WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME
OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

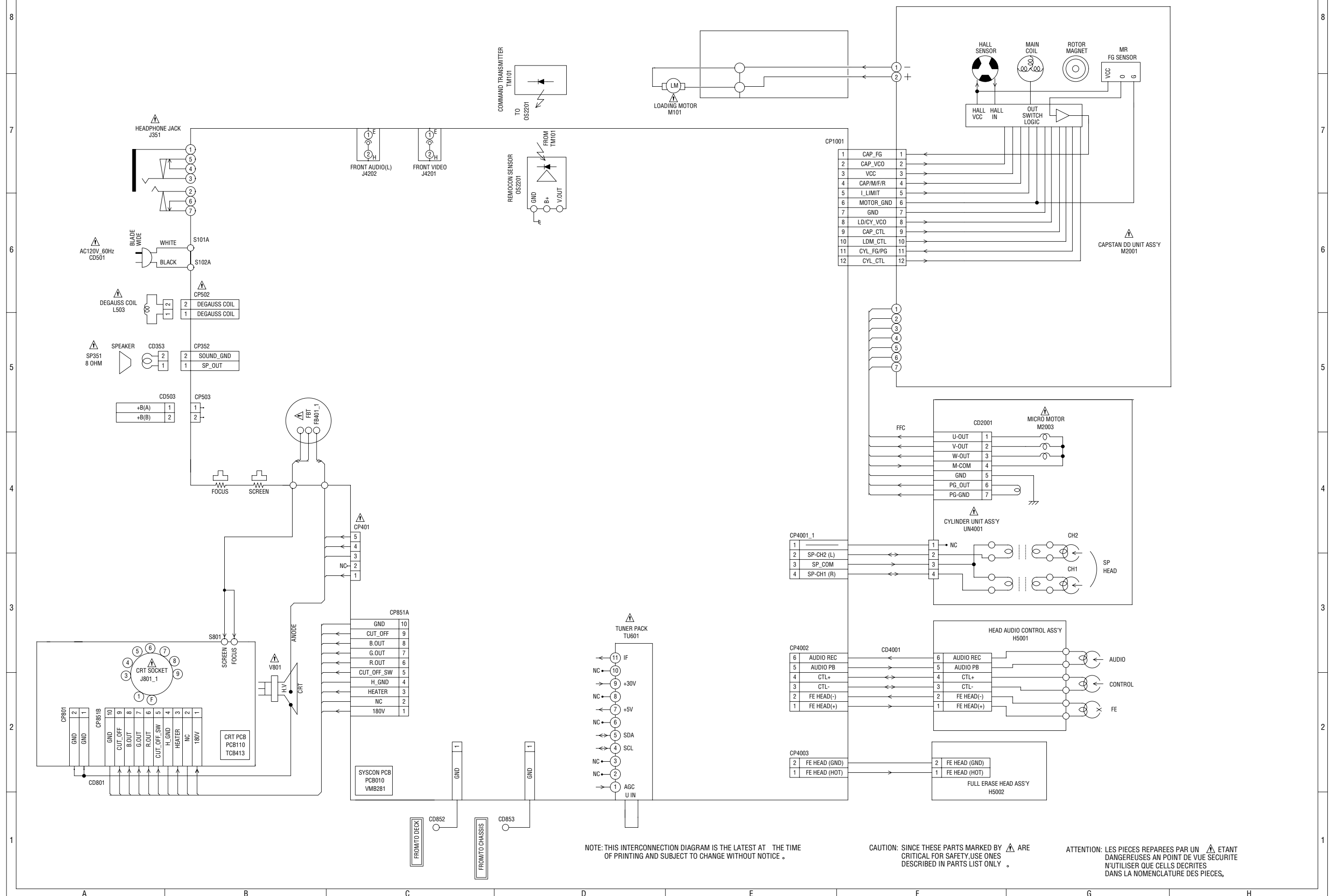
CAUTION: SINCE THESE PARTS MARKED BY  ARE
CRITICAL FOR SAFETY,USE ONES
DESCRIBED IN PARTS LIST ONLY .

ATTENTION: LES PIECES REPARÉES PAR UN  ETANT
DANGEREUSES AU POINT DE VUE SECURITE
N'UTILISER QUE CELLES DECRITES
DANS LA NOMENCLATURE DES PIECES.



 R.SIGNAL
 G.SIGNAL
 B.SIGNAL

INTERCONNECTION DIAGRAM



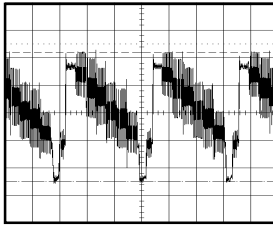
NOTE: THIS INTERCONNECTION DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

CAUTION: SINCE THESE PARTS MARKED BY ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY.

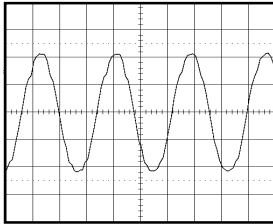
ATTENTION: LES PIECES REPARÉES PAR UN ÉTANT DANGEREUSES AU POINT DE VUE SÉCURITÉ, N'UTILISER QUE CELLES DÉCRITES DANS LA NOMENCLATURE DES PIÈCES.

WAVEFORMS

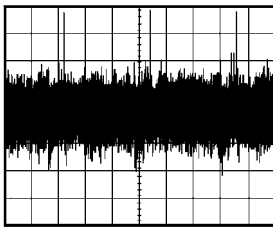
Y/C/AUDIO/HEAD AMP



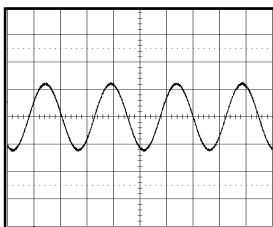
① PB
0.5V 20 μ s/div



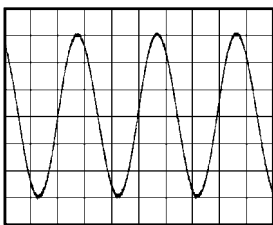
② 100mV 0.1 μ s/div



③ PB
10mV 20 μ s/div

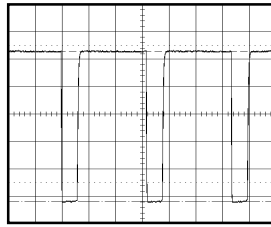


④ PB
0.5V 1ms/div

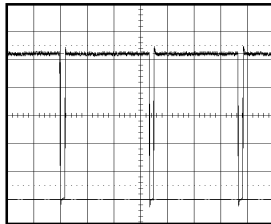


⑤ REC
10.0V 5 μ s/div

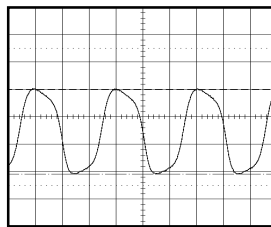
MICON



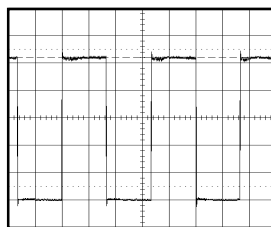
⑥ 1.0V 20 μ s/div



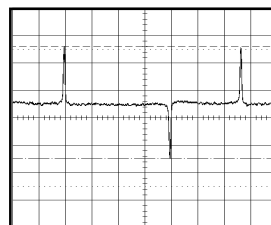
⑦ 0.5V 10ms/div



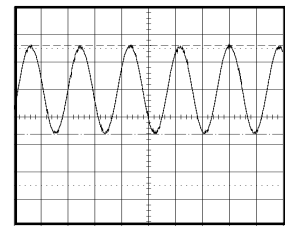
⑧ 1.0V 10 μ s/div



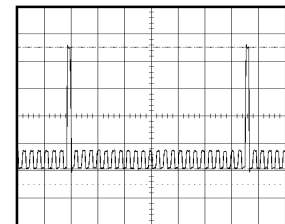
⑨ PB
1.0V 10ms/div



⑩ PB
1.0V 5ms/div

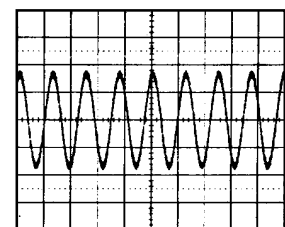


⑪ PB
0.5V 0.5ms/div



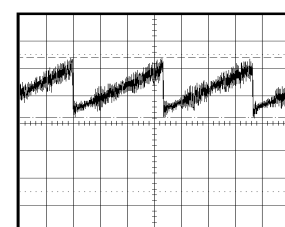
⑬ PB
1.0V 5ms/div

SOUND AMP

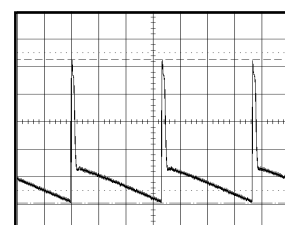


⑭ 200mV 2ms/div

DEFLECTION



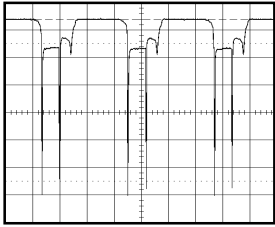
⑰ 0.5V 5ms/div



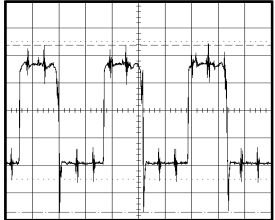
⑱ 10.0V 5ms/div

NOTE: The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

WAVEFORMS

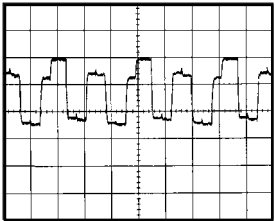


①⑨ 2.0V 20 μ s/div

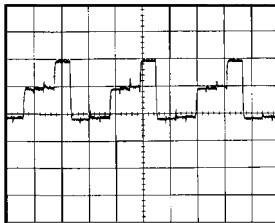


②⑩ 200mV 20 μ s/div

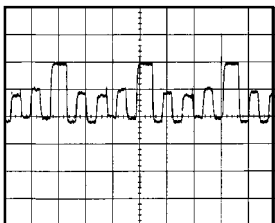
CRT



②① 50.0V 20 μ s/div



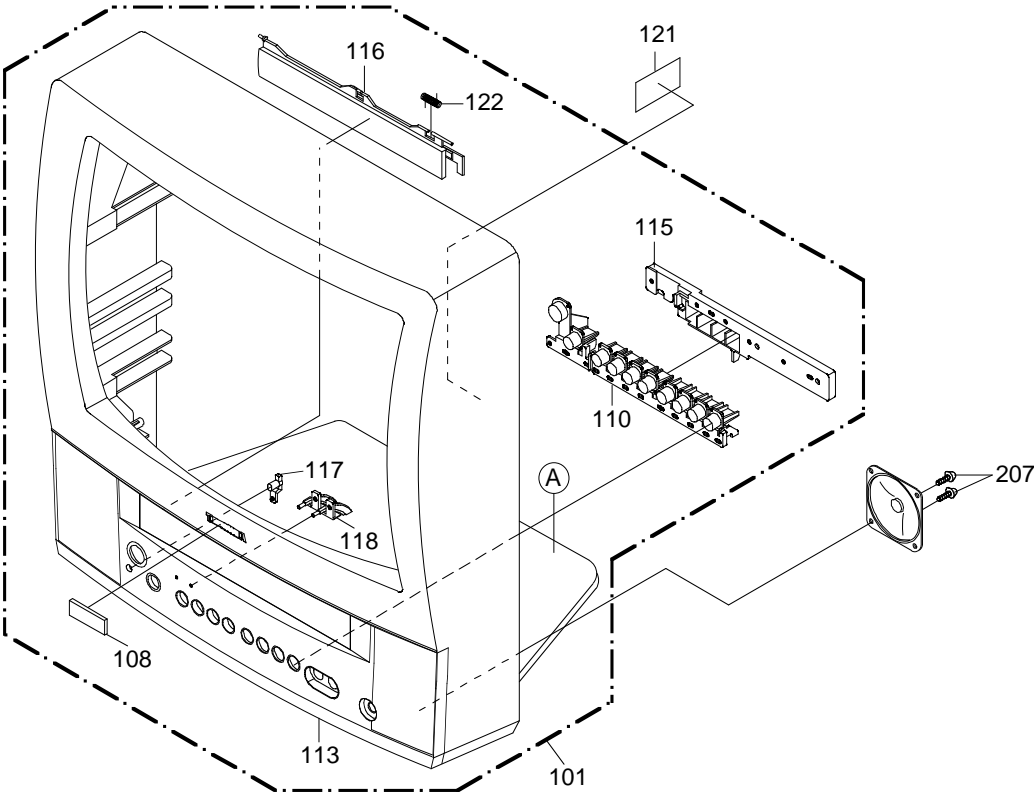
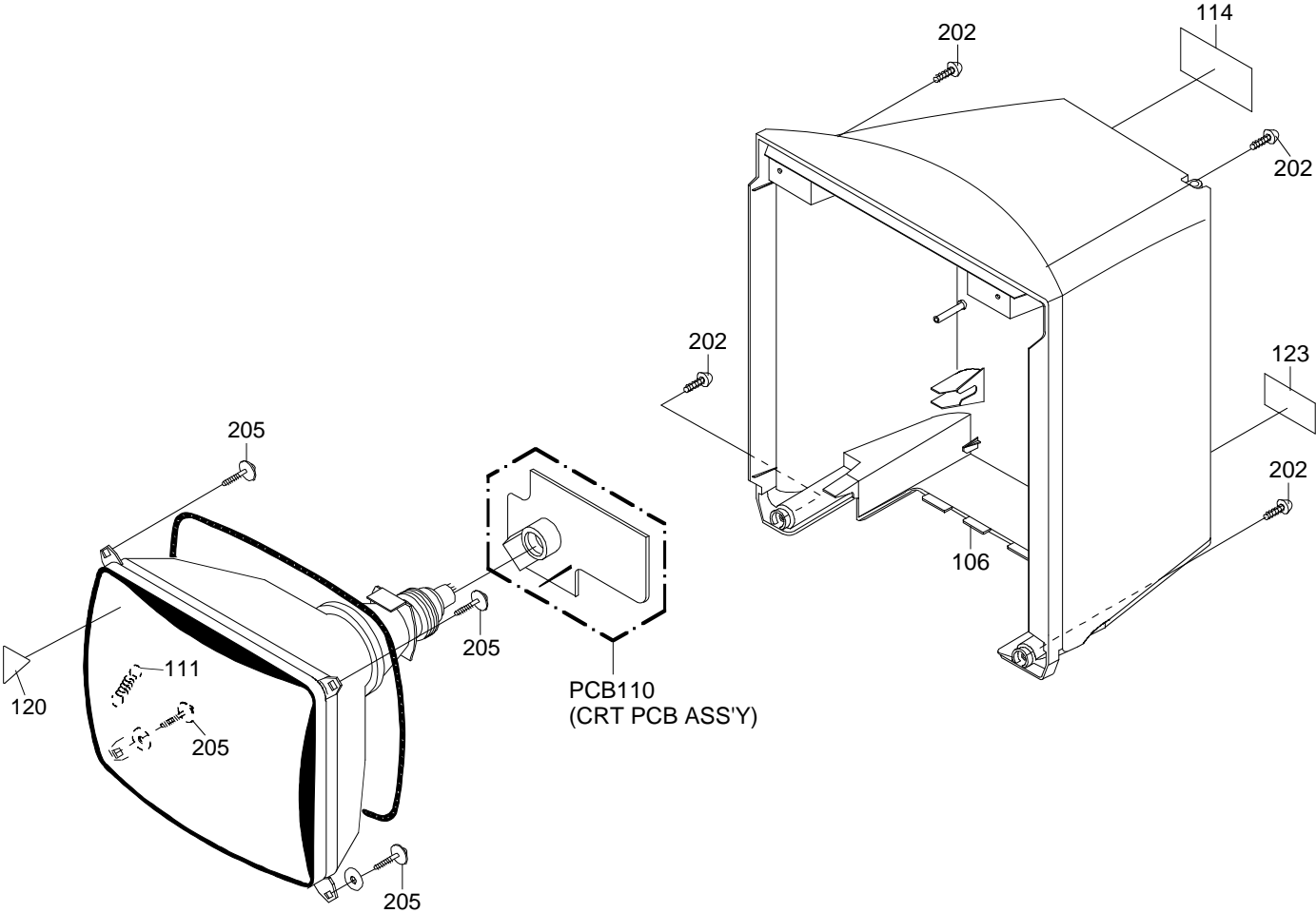
②② 50.0V 20 μ s/div



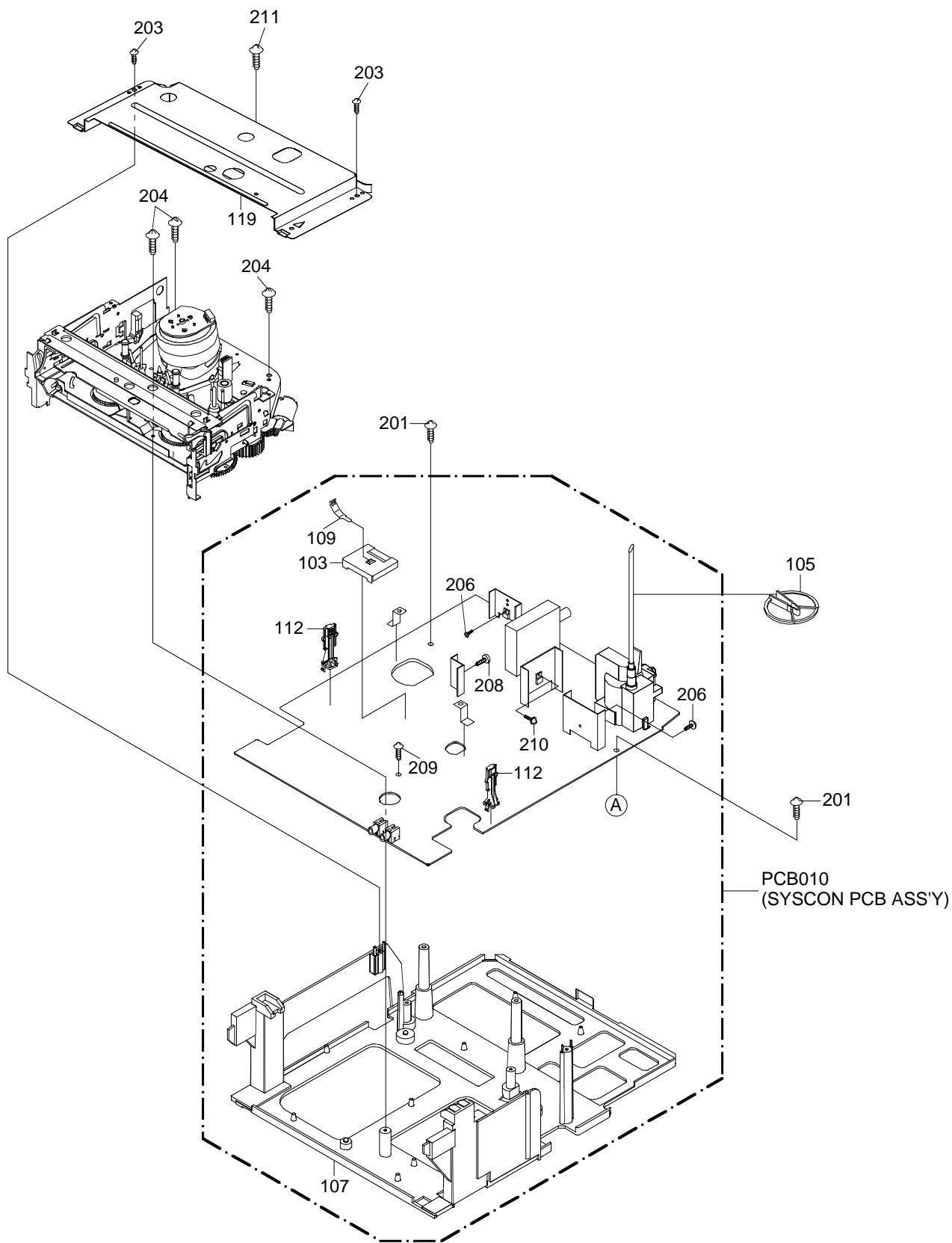
②③ 50.0V 20 μ s/div

NOTE: The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

MECHANICAL EXPLODED VIEW



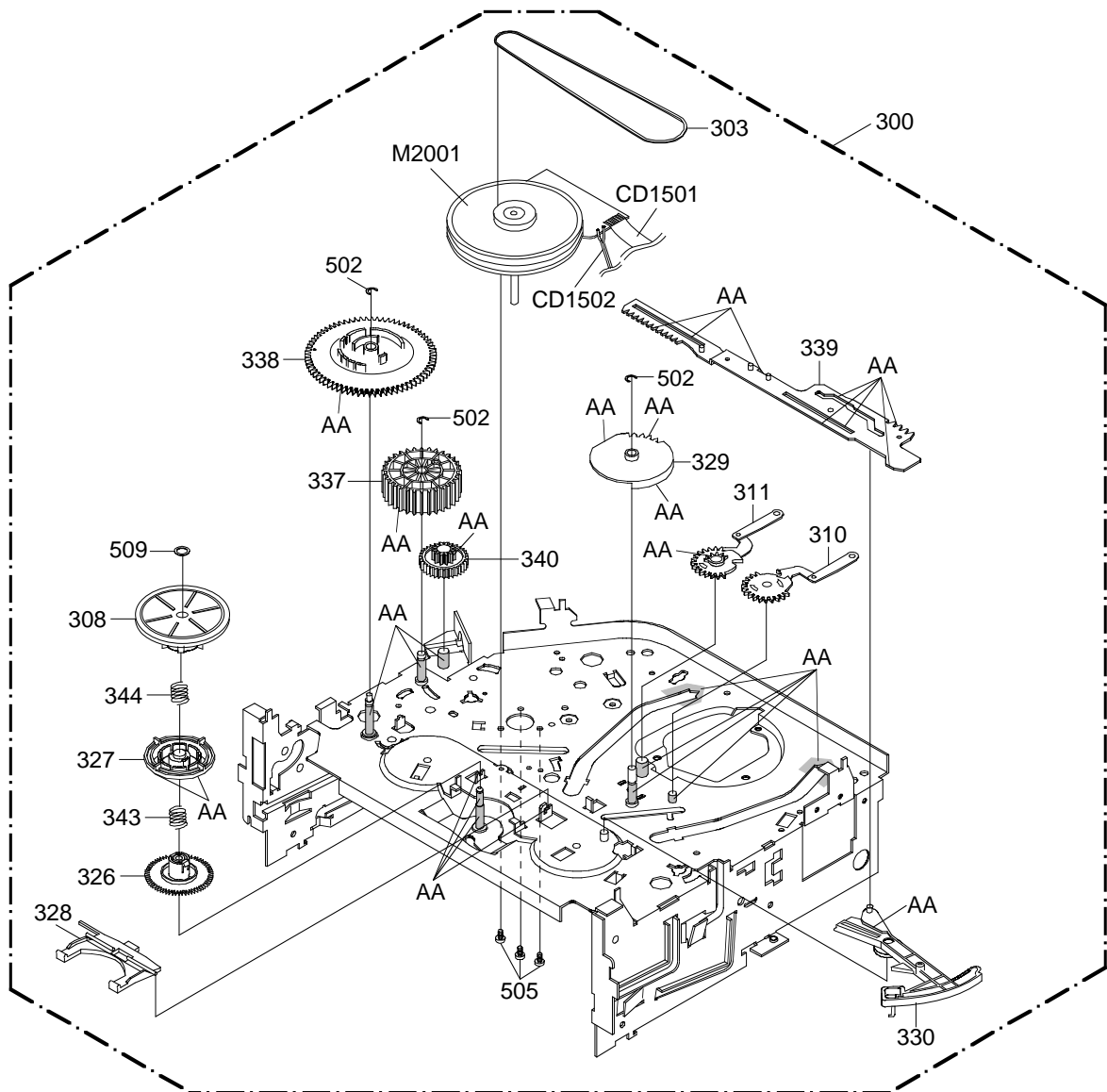
MECHANICAL EXPLODED VIEW



[illegible]

NOTE: Applying positions AA for the grease are displayed for this section.
Check if the correct grease is applied for each position.

CHASSIS EXPLODED VIEW (BOTTOM VIEW)



CLASS	MARK
GREASE	AA

NOTE: Applying positions AA for the grease are displayed for this section.
Check if the correct grease is applied for each position.

MECHANICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description	
101	AD301896	A5E202R720Z	CABINET,FRONT ASSY	
103	BZ710466	752WSA0230	SHIELD,CASE HEAD AMP	
105	BZ710260	899HV3T000	HOLDER,ANODE WIRE	
106	AD301759	702WPAA335	CABINET,BACK TOOL 1	or
	AD301760	702WPAA336	CABINET,BACK TOOL 2	
107	AD301656	761WPA0236	HOLDER,DECK	
108	AD301657	723549A011	BADGE,BRAND	
109	BZ710331	753WUAA006	SPRING,EARTH HEAD AMP	
110	AD301658	735WPBA527	BUTTON,FRAME	
111	BZ710009	741WUA0019	SPRING,EARTH	
112	BZ710498	85OP700038	HOLDER,END SENSOR	
113	AD301659	701WPJB977	CABINET,FRONT	
114	AD301736	722549A152	SHEET,RATING	
115	AD301661	735WPAA493	STOPPER,BUTTON	
116	AD301662	712WPJB628	FLAP	
117	AD301663	713WPA0249	GUIDE,REMOCON	
118	AD301664	713WPA0248	GLASS,LED	
119	AD301750	752WSAA051	PLATE,DECK SHIELD	
120	AD301737	723000C125	POP LABEL	
121	AD300007	7230006755	SHEET,CAUTION	
122	AD301686	743WKA0037	SPRING,FLAP	
123	AD301666	726000A039	SHEET,CRT NO.	
201	BZ710036	8117540B04	SCREW,TAPPING(B0) TRUSS	4x20
202	BZ710035	8117540A64	SCREW,TAPPING(B0) TRUSS	4x16
203	BZ710147	8107630604	SCREW,TAP TITE(S) BRAZIER	3x6
204	BZ710032	8110630A24	SCREW,TAP TITE(P) BRAZIER	3x12
205	BZ710321	8121F50B84	SCREW,TAP TITE(P) FAI20 FLAT	5x28
206	BZ710239	8109I30A04	SCREW,TAP TITE(B) WH7	3x10
207	BZ710030	8110630804	SCREW,TAP TITE(P) BRAZIER	3x8
208	BZ710562	8109I30804	SCREW,TAP TITE(B) WH7	3x8
209	BZ710028	8110330804	SCREW,TAP TITE(P) FLAT	3x8
210	BZ710018	8107630804	SCREW,TAP TITE(S) BRAZIER	3x8
211	AD301667	8110E30804	SCREW,TAP TITE(P) WH10	3X8
---	AD301669	792WHA0412	PACKAGE,TOP	
---	AD301670	792WHA0413	PACKAGE,BOTTOM	
---	AD301738	793WCDB571	GIFT BOX	
---	AD301739	A5E202R975	INSTRUCTION BOOK KIT	
---	AD301740	J5E20201A	INSTRUCTION BOOK	

CHASSIS REPLACEMENT PARTS LIST

	Location No.	TSB P/N	Reference No.	Description	
	300	AD301674	A5E201A420K	DECK ASS'Y	A5E201A420K
	301	BZ710564	85OA400234	PINCH ROLLER BLOCK	
	302	BZ710514	85OP900746	BRACKET,TOP 3V	
	303	BZ710193	85OP200290	BELT,CAPSTAN (S)	
	304	BZ710515	85OP600581	WORM	
	305	BZ710094	85OP500083	BASE,AC HEAD	
	306	BZ710112	85OP800324	SPRING,AC HEAD	
	307	BZ710516	85OA000459	MAIN CHASSIS ASS'Y	
	308	BZ710517	85OA200089	CLUTCH ASS'Y	
	309	BZ710518	85OA200090	ARM IDLER ASS'Y	
	310	BZ710519	85OA300065	LOADING ARM S UNIT	
	311	BZ710520	85OA300066	LOADING ARM T UNIT	
	312	BZ710521	85OA400223	INCLINED BASE T UNIT 3S	
	313	BZ710522	85OA400232	P5 ARM ASS'Y 2	
	314	BZ710650	85OA400235	TENSION ARM ASS'Y 2	
	315	BZ710524	85OA400231	INCLINED BASE S UNIT	
	316	BZ710525	85OP800358	SPRING,LOCKER	
	317	BZ710526	85OP900736	CASS,HOLDER	
	318	BZ710527	85OP900748	CASS,SIDE L	
	319	BZ710528	85OP900749	CASS,SIDE R	
	320	BZ710529	85OP900739	LOCKER,R	
	321	BZ710530	85OA900228	LINK UNIT	
	322	BZ710531	85OP000496	POST,CASS GUIDE	
	323	BZ710532	85OP200316	REEL,S (S)	
	324	BZ710533	85OP200317	REEL,T (S)	
	325	BZ710534	85OP200308	GEAR,IDLER	
	326	BZ710535	85OP200311	GEAR,CLUTCH	
	327	BZ710536	85OP200312	GEAR,COUPLING	
	328	BZ710537	85OP200313	LEVER,CLUTCH	
	329	BZ710538	85OP300194	GEAR,MAIN LOADING	
	330	BZ710092	85OP400490	LEVER,TENSION	
	331	BZ710093	85OP400492	HOLDER,TENSION	
	332	BZ710366	85OP400520	CAP.P4	
	333	BZ710762	85OP400542	BAND,TENSION	
	334	BZ710540	85OP400533	CONNECT,TENSION	
	335	BZ710541	85OP600573	ARM,BRAKE T	
	336	BZ710763	85OP600584	BAND,BRAKE T	
	337	BZ710543	85OP600577	CAM,PINCH ROLLER	
	338	BZ710544	85OP600578	CAM,MAIN	
	339	BZ710545	85OP600579	ROD,MAIN	
	340	BZ710546	85OP600582	GEAR,JOINT	
	341	BZ710110	85OP800322	SPRING,TENSION	
	342	BZ710547	85OP800360	SPRING,BRAKE T	
	343	BZ710548	85OP800355	SPRING,COUPLING	
	344	BZ710549	85OP800356	SPRING,RING	
	345	BZ710565	85OP900750	LEVER,LINK 2	
	346	BZ710551	85OP900744	LEVER,FLAP	
	347	BZ710552	85OP900745	CASS,OPENER	
	348	BZ710106	85OP700035	REFLECTOR,LED	
	349	BZ710796	85OP700039	COVER,BOT	
	501	BZ710049	8107226804	SCREW,TAP TITE(S) BIND	2.6x8
	502	BZ710058	83ETW30000	E-RING	3.0
	503	BZ710371	8107226404	SCREW,TAP TITE(S) BIND	2.6x4
	504	BZ710046	8102120604	SCREW,PAN	M2x6
	505	BZ710050	8109126604	SCREW,TAP TITE(B) PAN	2.6x6
	506	BZ710553	810A130404	SCREW/WASHER(A)	M3x4
	507	BZ710219	810A126504	SCREW/WASHER(A)	M2.6x5
	508	BZ710056	82Q264713N	POLYSLIDER WASHER	2.6x4.7xT0.13
	509	BZ710054	82P184505N	POLYSLIDER WASHER(CUT)	1.8x4.5xT0.5
	510	BZ710017	8107226604	SCREW,TAP TITE(S) BIND	2.6x6
	511	BZ710051	810A123504	SEMS A	M2.3x5.0
	CD1501	BZ614292	122H071704	CORD JUMPER	2H071704
	CD1502	BZ614339	122Y021902	CORD JUMPER	2Y021902
	H5001	AD301675	1523Q91003	HEAD (AUDIO CONTROL)	VTR-1X2RPE22-756
	H5002	AD301676	1543Q02014	HEAD (FULL ERASE)	VTR-1X2ERS11-154
△	M101	BZ710566	1596P98001	MOTOR (LOADING)	MXN13FB12K3 or
		BZ710554	1596S98001	MOTOR (LOADING)	MDB2B66
△	M2001	AD301677	1510S98038	CAPSTAN DD UNIT	F2QVB33
△	M2003	BZ710373	1589S11014	MICRO MOTOR	I2OAL03
△	UN4001	BZ610290	A5A305A500	CYLINDER UNIT ASS'Y	A5A305A500

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description
RESISTORS			
△ R402	BZ210225	R3X181271J	R,METAL OXIDE 270 OHM 1W
△ R410	AD301140	R3X28A221J	R,METAL OXIDE 220 OHM 2W
△ R415	BZ210053	R002T22R2J	RC 2.2 OHM 1/2W
△ R420	AD301014	R4X5T6472F	R,METAL 4.7K OHM 1/6W
△ R442	AD300036	R4X5T6562F	R,METAL 5.6K OHM 1/6W
△ R443	BZ210070	R801R7822F	RC 8.2K OHM 1/10W
△ R447	BZ210021	R65582680J	R,FUSE 68 OHM 1/2W
△ R449	BZ210241	R655U2010J	R,FUSE 1 OHM 1/2W
△ R450	AD301631	R655815R6J	R,FUSE 5.6 OHM 1W
△ R500	BZ210080	R0G3K2275K	RC 2.7M OHM 1/2W
△ R501	AD301632	R5Y2CD3R3J	R,CEMENT 3.3 OHM 5W
△ R502	BZ210215	R3X28B100J	R,METAL OXIDE 10 OHM 3W
△ R508	BZ210158	R002T2563J	RC 56K OHM 1/2W
△ R509	BZ210206	R002T2155J	RC 1.5M OHM 1/2W
△ R510	BZ210216	R801R7105J	RC 1M OHM 1/10W
△ R512	BZ210158	R002T2563J	RC 56K OHM 1/2W
△ R514	BZ210048	R3X181R33J	R,METAL OXIDE 0.33 OHM 1W
△ R517	BZ210217	R3X181331J	R,METAL OXIDE 330 OHM 1W
△ R520	BZ210009	R3X28AR82J	R,METAL OXIDE 0.82 OHM 2W
△ R528	BZ210190	R63581R22J	R,FUSE 0.22 OHM 1W
△ R529	BZ210084	R4X5T4272F	R,METAL 2.7K OHM 1/4W
△ R802	BZ210089	R3X181123J	R,METAL OXIDE 12K OHM 1W
△ R805	BZ210089	R3X181123J	R,METAL OXIDE 12K OHM 1W
△ R810	BZ210089	R3X181123J	R,METAL OXIDE 12K OHM 1W
CAPACITORS			
C354	BZ110135	E02L02222M	CE 2200 UF 16V or
	AD301633	E02LT2222M	CE 2200 UF 16V
△ C402	BZ110077	E02L04102M	CE 1000 UF 35V or
	AD301634	E02LT4102M	CE 1000 UF 35V
△ C407	BZ110078	E02L03102M	CE 1000 UF 25V or
	BZ110044	E02LT3102M	CE 1000 UF 25V
△ C419	AD300064	E02LT8220M	CE 22 UF 100V
C423	BZ210173	P4J7F3474J	CMPP 0.47 UF 250V PMS
△ C424	BZ110137	P4N8FJ822H	CMPP 0.0082UF 1.25KV
△ C431	BZ110103	E02LTD100M	CE 10 UF 250V
△ C506	BZ110025	P2122B224M	CE 0.22 UF 275V ECQUL
△ C507	BZ110061	C0JTB0513K	CC 0.001 UF 500V B
△ C509	AD301635	E51CGC331M	CE 330 UF 200V
△ C511	BZ110041	E02LT3471M	CE 470 UF 25V
△ C516	BZ110206	C0JTB05Q2K	CC 470 PF 500V B
C517	AD301636	C0PLRR7B2K	CC 120 PF 2KV RR
△ C521	BZ110130	E62NFC221M	CE 220 UF 200V
△ C522	AD300788	E02LU5010M	CE 1 UF 50V
C523	BZ110104	E0EL02332M	CE 3300 UF 16V
△ C524	BZ110135	E02L02222M	CE 2200 UF 16V or
	AD301633	E02LT2222M	CE 2200 UF 16V
△ C529	BZ110133	CB3930MQ2K	CC 470 PF 250V
C535	BZ110202	C0PLRR713K	CC 0.001 UF 2KV RR
△ C539	BZ110227	CD39E0ML3M	CC 0.0033UF 250V
C541	AD301637	C03L0R7G3K	CC 0.0018UF 2KV R
C801	BZ110201	C0PLRR7H3K	CC 0.0022 UF 2KV RR
DIODES			
D401	BZ410043	D2WT011E10	DIODE,SILICON 11E1-EIC
△ D402	AD300731	D2WXN49370	DIODE,SILICON 1N4937
D403	BZ410019	D97U03001B	DIODE,ZENER MTZJ30B T-77
D404	BZ410019	D97U03001B	DIODE,ZENER MTZJ30B T-77
D405	BZ410043	D2WT011E10	DIODE,SILICON 11E1-EIC
D407	BZ410043	D2WT011E10	DIODE,SILICON 11E1-EIC
△ D409	BZ410017	D94TA11B13	DIODE,ZENER HZ11B3L TD
D410	BZ410022	D97U06R81B	DIODE,ZENER MTZJ6.8B T-77
D411	BZ410043	D2WT011E10	DIODE,SILICON 11E1-EIC
△ D412	AD300731	D2WXN49370	DIODE,SILICON 1N4937
△ D413	AD300731	D2WXN49370	DIODE,SILICON 1N4937
△ D501	BZ410061	D97U01001B	DIODE,ZENER MTZJ10B T-77
D502	BZ410006	D1VT001330	DIODE,SILICON 1SS133T-77
D503	BZ410058	D97U08R21B	DIODE,ZENER MTZJ8.2B T-77
D504	BZ410006	D1VT001330	DIODE,SILICON 1SS133T-77
△ D505	BZ410010	D28T21DQN9	DIODE,SCHOTTKY 21DQ09N-TA2B1
△ D507	BZ410010	D28T21DQN9	DIODE,SCHOTTKY 21DQ09N-TA2B1
D508	BZ410006	D1VT001330	DIODE,SILICON 1SS133T-77
△ D510	BZ410080	D2WXR02AM0	DIODE,SILICON RU2AM-EIC

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description
DIODES			
△D512	BZ410010	D28T21DQN9	DIODE,SCHOTTKY 21DQ09N-TA2B1
D513	BZ410006	D1VT001330	DIODE,SILICON 1SS133T-77
D514	BZ410006	D1VT001330	DIODE,SILICON 1SS133T-77
△D515	BZ410037	D97U03301B	DIODE,ZENER MTZJ33B T-77
△D517	AD300731	D2WXN49370	DIODE,SILICON 1N4937
△D518	BZ410085	D2WXN40050	DIODE,SILICON 1N4005-EIC
△D519	BZ410010	D28T21DQN9	DIODE,SCHOTTKY 21DQ09N-TA2B1
△D520	BZ410085	D2WXN40050	DIODE,SILICON 1N4005-EIC
△D521	BZ410085	D2WXN40050	DIODE,SILICON 1N4005-EIC
D528	BZ410021	D97U05R61B	DIODE,ZENER MTZJ5.6B T-77
△D530	BZ410085	D2WXN40050	DIODE,SILICON 1N4005-EIC
D533	BZ410006	D1VT001330	DIODE,SILICON 1SS133T-77
△D534	AD300671	D97U01801B	DIODE,ZENER MTZJ18B T-77
△D535	AD300671	D97U01801B	DIODE,ZENER MTZJ18B T-77
D536	AD300731	D2WXN49370	DIODE,SILICON 1N4937
D537	BZ410006	D1VT001330	DIODE,SILICON 1SS133T-77
D601	BZ410006	D1VT001330	DIODE,SILICON 1SS133T-77
D602	BZ410058	D97U08R21B	DIODE,ZENER MTZJ8.2B T-77
D603	BZ410006	D1VT001330	DIODE,SILICON 1SS133T-77
D605	BZ410059	D2WT11ES10	DIODE,SILICON 11ES1-EIC
D608	BZ410077	D2WXS1400	DIODE,SCHOTTKY SB140-EIC
D609	BZ410022	D97U06R81B	DIODE,ZENER MTZJ6.8B T-77
D610	BZ410022	D97U06R81B	DIODE,ZENER MTZJ6.8B T-77
D611	BZ410022	D97U06R81B	DIODE,ZENER MTZJ6.8B T-77
D801	BZ410006	D1VT001330	DIODE,SILICON 1SS133T-77
D802	BZ410006	D1VT001330	DIODE,SILICON 1SS133T-77
D803	BZ410006	D1VT001330	DIODE,SILICON 1SS133T-77
D1001	AD301638	0010E00330	INFRARED LED LTE-3271T-012A-O
D1002	BZ410006	D1VT001330	DIODE,SILICON 1SS133T-77
D1004	BZ410054	0021721150	LED SLR-342VCT32
D1013	BZ410054	0021721150	LED SLR-342VCT32
D1014	BZ410022	D97U06R81B	DIODE,ZENER MTZJ6.8B T-77
D2201	BZ410022	D97U06R81B	DIODE,ZENER MTZJ6.8B T-77
D4001	BZ410034	D97U01301B	DIODE,ZENER MTZJ13B T-77
D4002	BZ410034	D97U01301B	DIODE,ZENER MTZJ13B T-77
ICS			
△IC351	BZ611001	I01DP75110	IC AN7511
△IC401	BZ611053	I01TD55220	IC AN5522
△IC501	BZ611054	I1KA98R050	IC KIA78R05PI
△IC502	BZ410055	0002500450	PHOTO COUPLER TLP621(GR)
IC601	AD301639	I06FC61250	IC M61250FP
IC1001	AD301640	I56F57083A	IC OEC7083A
△IC1003	AD301641	I9UF032310	IC PST3231NR
IC1099	AD301642	A5E201A015	IC S-24C04BDP-LA
IC4001	AD301643	I03F3206M0	IC LA71206M-MPB
TRANSISTORS			
Q403	BZ510068	TNAAJ05003	COMPOUND TRANSISTOR KRC111SRTK
Q404	AD300610	TPAAD05003	COMPOUND TRANSISTOR KRA104SRTK
△Q405	BZ510089	TC5T01627Y	TRANSISTOR,SILICON 2SC1627_Y(TPE2)
△Q406	BZ510120	TD3U021400	TRANSISTOR,SILICON TT2140LS-CBC
△Q503	BZ510004	TA3T016240	TRANSISTOR,SILICON 2SA1624-AA
Q505	BZ510001	T6YJ1037K0	TRANSISTOR,SILICON 2SA1037AKT146R,S
Q507	BZ510069	TCATC31980	TRANSISTOR,SILICON KTC3198-AT(Y,GR)
Q508	BZ510071	TNAAB05003	COMPOUND TRANSISTOR KRC102SRTK
△Q510	BZ510093	TJXG5NC500	FET STP5NC50FP
△Q511	BZ510070	TCAT032034	TRANSISTOR,SILICON KTC3203_Y-AT
Q601	BZ510001	T6YJ1037K0	TRANSISTOR,SILICON 2SA1037AKT146R,S
Q602	BZ510070	TCAT032034	TRANSISTOR,SILICON KTC3203_Y-AT
Q603	BZ510070	TCAT032034	TRANSISTOR,SILICON KTC3203_Y-AT
Q604	BZ510074	TDAT00863Y	TRANSISTOR,SILICON KTD863_Y-AT
Q605	BZ510074	TDAT00863Y	TRANSISTOR,SILICON KTD863_Y-AT
Q606	BZ510070	TCAT032034	TRANSISTOR,SILICON KTC3203_Y-AT
Q607	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON 2SC2412KT146 R,S
Q609	BZ510071	TNAAB05003	COMPOUND TRANSISTOR KRC102SRTK
Q611	BZ510090	TPAAB05001	COMPOUND TRANSISTOR KRA102SRTK
Q612	BZ510071	TNAAB05003	COMPOUND TRANSISTOR KRC102SRTK
△Q804	BZ510091	TCA0042170	TRANSISTOR,SILICON KTC4217(O,Y)
△Q805	BZ510091	TCA0042170	TRANSISTOR,SILICON KTC4217(O,Y)
△Q806	BZ510091	TCA0042170	TRANSISTOR,SILICON KTC4217(O,Y)
Q1003	BZ410106	0002700680	PHOTO COUPLER RPI-352C40N
Q1004	BZ510067	TNAAC05002	COMPOUND TRANSISTOR KRC103SRTK

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description
TRANSISTORS			
△ Q1005	BZ410107	0002700690	PHOTO COUPLER RPI-303
Q1007	BZ510071	TNAAB05003	COMPOUND TRANSISTOR KRC102SRTK
Q1009	BZ410106	0002700680	PHOTO COUPLER RPI-352C40N
Q1011	BZ410097	0000M00390	PHOTO TRANSISTOR ST-304L
Q1013	BZ410097	0000M00390	PHOTO TRANSISTOR ST-304L
Q1014	BZ510067	TNAAC05002	COMPOUND TRANSISTOR KRC103SRTK
Q4001	BZ510069	TCATC31980	TRANSISTOR,SILICON KTC3198-AT(Y,GR)
Q4002	BZ510069	TCATC31980	TRANSISTOR,SILICON KTC3198-AT(Y,GR)
Q4003	BZ510072	TPAAC05002	COMPOUND TRANSISTOR KRA103SRTK
Q4005	BZ510073	TAATA12660	TRANSISTOR,SILICON KTA1266-AT(Y,GR)
Q4006	BZ510070	TCAT032034	TRANSISTOR,SILICON KTC3203_Y-AT
Q4007	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON 2SC2412KT146 R,S
Q4009	BZ510001	T6YJ1037K0	TRANSISTOR,SILICON 2SA1037AKT146R,S
Q4010	BZ510001	T6YJ1037K0	TRANSISTOR,SILICON 2SA1037AKT146R,S
Q4011	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON 2SC2412KT146 R,S
Q4012	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON 2SC2412KT146 R,S
Q4202	BZ510071	TNAAB05003	COMPOUND TRANSISTOR KRC102SRTK
COILS & TRANSFORMERS			
L401	AD301644	021L75472J	COIL 4.7 MH
△ L502	BZ310075	029X000087	COIL,LINE FILTER SS24V-10100
△ L503	BZ310076	028R140031	COIL,DEGAUSS 8R140031
L601	BZ310012	021LA6R56M	COIL 0.56 UH
L603	BZ310040	02167F470J	COIL 47 UH
L607	BZ310038	021LA6120K	COIL 12 UH
L609	BZ310041	02167F101J	COIL 100 UH
L616	BZ310169	021LA6R39M	COIL 0.39 UH
L801	AD301757	021673271K	COIL 270 UH
L1001	BZ310009	021LA62R2K	COIL 2.2 UH
L4001	BZ310039	02167F220J	COIL 22 UH
L4003	BZ310041	02167F101J	COIL 100 UH
L4005	BZ310040	02167F470J	COIL 47 UH
L4006	BZ310040	02167F470J	COIL 47 UH
L4009	BZ310041	02167F101J	COIL 100 UH
T401	BZ310157	045009003J	TRANS,HORIZONTAL DRIVE ETH09K14BZ
△ T501	BZ310160	0481290804	TRANSFORMER,SWITCHING 81290804
T4001	BZ310114	031626009R	COIL,BIAS OSC 1626009
JACKS			
△ J351	BZ614361	060J131015	HEADPHONE JACK MSJ-2000
△ J801	AD301147	066F120018	SOCKET,CATHODE RAY TUBE ISMS01S
J4201	AD300680	060Q401077	RCA JACK AV1-09D-3
J4202	AD300681	060Q401076	RCA JACK AV1-09D-4
SWITCHES			
SW1001	BZ612016	0508S11001	SWITCH (LEAF) LSA-1144EAU
SW2201	BZ612010	0504101T34	SWITCH,TACT EVQ21505R
SW2202	BZ612010	0504101T34	SWITCH,TACT EVQ21505R
SW2203	BZ612010	0504101T34	SWITCH,TACT EVQ21505R
SW2204	BZ612010	0504101T34	SWITCH,TACT EVQ21505R
SW2205	BZ612010	0504101T34	SWITCH,TACT EVQ21505R
SW2206	BZ612010	0504101T34	SWITCH,TACT EVQ21505R
SW2207	BZ612010	0504101T34	SWITCH,TACT EVQ21505R
SW2208	BZ612010	0504101T34	SWITCH,TACT EVQ21505R
SW2209	BZ612010	0504101T34	SWITCH,TACT EVQ21505R
SW2210	BZ612010	0504101T34	SWITCH,TACT EVQ21505R
VARIABLE RESISTORS			
VR401	BZ210218	V1K63H3BTE	VOLUME,SEMI FIXED NVG6TLTAB222
VR502	BZ210024	V1163L2BTC	VOLUME,SEMI FIXED EVNCYAA03BY2
P.C.BOARD ASSEMBLIES			
PCB010	AD301733	A5E202R010	PCB ASS'Y VMB281A
PCB110	AD301734	A5E202R110	PCB ASS'Y TCB413A
MISCELLANEOUS			
B501	BZ310122	024HT03563	CORE,BEADS W4BRH3.5X6X1.0X2
B503	BZ310121	024HT03553	CORE,BEADS W5RH3.5X5X1.0
B505	BZ310121	024HT03553	CORE,BEADS W5RH3.5X5X1.0
B602	BZ310121	024HT03553	CORE,BEADS W5RH3.5X5X1.0
BL001	BZ310014	023C00022A	COIL,BALUN HPN-01
CD353	BZ614150	06CH12444A	CORD,CONNECTOR CH12444A
△ CD501	AD300685	120R414903	CORD,AC BUSH 0R414903
CD503	BZ614133	069X620040	CONNECTOR JM-2BK-61
CD801	BZ614175	06CU82039A	CORD,CONNECTOR SM1098-009-1A
CD803	BZ614317	06CH012101	CORD,CONNECTOR CH012101
CD851	AD300889	WHL6032038	FLAT CABLE AWM2468 A WG26 10C BLACK 320MM

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description
MISCELLANEOUS			
CD852	BZ614100	06CH01408A	CORD,EIS CONNECTOR
CD853	BZ614317	06CH012101	CORD,CONNECTOR
CF601	BZ613031	1029045R7G	FILTER,SAW
CF602	AD300513	1012T04702	FILTER,CERAMIC TRAP
CF603	AD301647	1012T4R520	FILTER,CERAMIC
CF604	AD301648	1012T4R519	FILTER,CERAMIC TRAP
CP351	AD301329	069E260659	CONNECTOR PCB SIDE
CP352	BZ614365	069S120419	CONNECTOR PCB SIDE
CP401	BZ614303	069S450089	CONNECTOR PCB SIDE
CP502	AD300687	069S420110	CONNECTOR PCB SIDE
CP503	BZ614137	069X620030	CONNECTOR PCB SIDE
CP504	BZ614016	069W01001A	CONNECTOR PCB SIDE
CP505	BZ614016	069W01001A	CONNECTOR PCB SIDE
CP801	BZ614269	069S320010	CONNECTOR PCB SIDE
CD4001	BZ614373	122F061502	CORD,JUMPER
CP1001	BZ614289	06972C0010	CONNECTOR PCB SIDE
CP1003	BZ614138	0694240139	CONNECTOR PCB SIDE
CP4001	BZ614054	0697240600	CONNECTOR PCB SIDE
CP4002	BZ614050	069J760029	CONNECTOR PCB SIDE
CP4003	AD301649	067U002019	WIRE HOLDER
CP851A	BZ614273	067U010049	WIRE HOLDER
CP851B	BZ614273	067U010049	WIRE HOLDER
CUS013	BZ710149	800WFAA008	CUSHION C
EL001	BZ614043	124116281A	EYE LET
EL002	BZ614044	124120301A	EYE LET
F501	BZ614504	081PC05005	FUSE
FB401	AD301650	043214037F	TRANSFORMER,FLYBACK
FH501	BZ614005	06710T0006	HOLDER,FUSE
FH502	BZ614005	06710T0006	HOLDER,FUSE
OS2201	BZ614199	077Q004017	REMOTE RECEIVER
SP351	BZ614200	070C533019	SPEAKER
TH501	BZ410079	DF5EL3R0A0	DEGAUSS ELEMENT
TM101	AD301651	076D0GCO10	TRANSMITTER
TU601	AD301652	0145K00062	TUNER,VHF-UHF
V801	BZ614512	09811404C9	CRT W/DY
X602	AD301653	100DT3R531	CRYSTAL
		100CT3R505	CRYSTAL
X1001	BZ613002	100CT01207	CRYSTAL
X1002	BZ613006	100DA32R01	CRYSTAL
X4001	BZ613017	100CT3R502	CRYSTAL
RESISTOR			
	RC.....	CARBON RESISTOR	
CAPACITORS			
	CC.....	CERAMIC CAPACITOR	
	CE.....	ALUMI ELECTROLYTIC CAPACITOR	
	CP.....	POLYESTER CAPACITOR	
	CPP.....	POLYPROPYLENE CAPACITOR	
	CPL.....	PLASTIC CAPACITOR	
	CMP.....	METAL POLYESTER CAPACITOR	
	CMPL.....	METAL PLASTIC CAPACITOR	
	CMPP.....	METAL POLYPROPYLENE CAPACITOR	

TOSHIBA CORPORATION

1-1, SHIBAURA 1-CHOME, MINATO-KU, TOKYO 105-8001, JAPAN